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THE UNIVERSITY OF ALBERTA

METACOGNITIVE READING STRATEGY AWARENESS OF
GIFTED, AVERAGE, AND LEARNING DISABLED STUDENTS

BY

MARIE L. SHAPKA

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN
PARTIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF EDUCATION

IN

COUNSELLING AND SCHOOL PSYCHOLOGY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

FALL, 1990



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ISBN 0-315-64872-4

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Students

DEGREE: Master of Education

YEAR THIS DEGREE GRANTED: 1990

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The undersigned certify they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled 'Metacognitive Reading Strategy Awareness of Gifted, Average, and Learning Disabled Students' submitted by Marie L. Shapka in partial fulfillment of the requirements for the degree of Master of Education.

Prof. J. L. ...
.....
(Supervisor)

William Stapan
.....

Date: ... *August 28, 1990*

DEDICATION

To my husband Ray, for his constant
love, friendship, and support

and

To my daughter Tania, for her
love, inspiration, and joy.

ABSTRACT

This research study investigated differences in metacognitive reading strategy awareness of gifted, average, and learning disabled students. Evaluation, planning, regulation, and conditional knowledge were the four specific components of reading strategy awareness examined. A secondary purpose was to investigate the relationship between reading strategy awareness and reading comprehension performance.

The sample consisted of 356 fourth grade students from 22 school jurisdictions across a wide geographic area in northern and central Alberta. These included: 116 gifted, 127 average, and 113 learning disabled students, all enrolled in regular grade four classes. The Index of Reading Awareness questionnaire was used to assess reading strategy awareness. Reading comprehension was measured by the reading subtest of the Canadian Achievement Test. Data was analyzed using analyses of variance, Scheffe tests, and a product-moment correlational analysis.

Findings revealed all three groups of students, including the learning disabled, to possess some metacognitive knowledge about reading strategies. The gifted students scored the highest on overall reading strategy awareness, while the learning disabled students scored the lowest. Significant differences between the gifted and the learning disabled students were obtained on

overall reading strategy awareness, and on three of the four subscales: evaluation, regulation, and conditional knowledge. The correlational analysis revealed a statistically significant, although low, relationship between reading comprehension and overall reading strategy awareness. With respect to planning, no significant differences between the three groups were obtained. Furthermore, no relationship between reading comprehension and the planning subscale was established. Implications of the findings, their relation to previous research studies and recommendations for future research are discussed.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to Dr. Robert Mulcahy for his expert guidance and his insightful suggestions in supervising this thesis.

To Dr. Fern Snart and Dr. William Fagan, I wish to express my gratitude for serving as members of my examining committee.

I would like to thank Dr. Charles Norman for his assistance with the data analysis. A special thank you to Eva Stelter for her assistance in proofreading this thesis.

Sincere thanks are extended to the students who participated in this research study and to their parents.

To my parents, John and Alice Sosniuk and to my family who provided me with encouragement and support in this endeavor, I extend my appreciation. I would like to thank Elaine Dochuk for her suggestions and for being a good friend.

Finally, I am deeply grateful to my husband, Ray, for his encouragement, patience, and support throughout my graduate program and in the completion of this thesis.

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CHAPTER I

INTRODUCTION

"Learning to read is a foundation for literacy and a gateway to education" (Paris, Wixson, & Palincsar, 1986, p. 91).

As parents and educators, we are faced with the difficult task of educating our children and youth of today for a rapidly changing, information-explosive society (Mulcahy, Peat, Mancini, Andrews, & Marfo, 1989). There has been an ever increasing realization that our educational system as it is today is inadequate in preparing our children for a "society in which change is the only constant" (Jones, 1986, p. 5). In an effort to select students with a higher level of competence, post secondary institutions have imposed literacy testing and stricter entrance requirements. The skills and expectations of today's youth are quite different from what they have been in the past.

In order to prepare our students for the future, we need to teach them "how to learn", rather than "what to learn" (Mulcahy et al., 1989, p. 287). Students will need to become self-directed learners. Self-directed learners utilize processes such as planning, evaluation, and regulation. They develop a keen and sustained interest in learning (Paris, Lipson, & Wixson, 1983; Wang & Peverly,

1987). Such students are proficient readers and independent learners.

Reading is a critical component of this learning process. It is one of the major areas of concern for parents, teachers, and researchers. Since students' performance in reading affects other curricular areas, school success is determined to a large degree by students' success in reading comprehension and their ability to effectively apply reading processes. Thus, it is not surprising, that a large part of the instructional time in the elementary classroom is allocated for reading instruction.

During the past decade, the research on reading comprehension has expanded rapidly. Much of this research has focussed on metacognition within the context of reading instruction (Jacobs & Paris, 1987; Paris & Oka, 1986). Reading is a complex process which requires the orchestration of many skills and processes. Metacognitive knowledge, or reading awareness, is an important component in the reading process which distinguishes skilled from unskilled readers (Canney & Winograd, 1979; Forrest-Pressley & Waller, 1984; Garner & Kraus, 1981-1982; Moore, 1983; Moore & Kirby, 1981; Myers & Paris, 1978; Paris & Jacobs, 1984).

Proficient readers have been described as "strategic readers". They are aware of the features of the text, the

demands of the task, and the personal characteristics involved in reading. They are able to report the different strategies required for various reading purposes. In contrast, unskilled readers appear to lack this awareness (Moore, 1983; Moore & Kirby, 1981; Myers & Paris, 1978; Paris, Oka, & Debritto, 1983). This may be a plausible explanation as to why the unskilled readers do not spontaneously employ comprehension strategies in reading (Paris & Lindauer, 1982; Paris et al., 1986). Metacognitive knowledge about reading strategies precedes the use of the strategies (Forrest-Pressley & Waller, 1984; Paris, 1984). It is unrealistic to expect students to utilize such strategies if they do not have this reading awareness.

The intent of this research is to provide further insight into the role of metacognitive knowledge in reading. The present study is designed to investigate reading strategy awareness in gifted, average, and learning disabled students.

CHAPTER II

RATIONALE, PURPOSE, RESEARCH QUESTIONS, AND DEFINITIONS

Rationale

Many cognitive psychologists and reading theorists emphatically authorize metacognition as being a critical component of independent, efficient learning, and successful reading (Babbs & Moe, 1983; Brown, Armbruster, & Baker, 1986; Costa, 1984; Flavell, 1979; Forrest-Pressley & Waller, 1984; Garner, 1987; Jacobs & Paris, 1987). Research studies have demonstrated a positive relationship between students' awareness and ability to utilize their metacognitive skills and their achievement (Wang & Peverly, 1987). The reader must be aware of his/her level of comprehension and, when necessary, employ appropriate reading actions or strategies (e.g. re-reading or self-questioning) in order to clarify what has been read (Markman, 1981).

According to Jacobs and Paris (1987) self-monitored learning and cognitive reading strategies have long been neglected in reading theories. However, they caution that the concept of metacognition may have been prematurely accepted. Research methodology has been criticized, leading to some skepticism on the conclusiveness of the studies (Jacobs & Paris, 1987). Jacobs and Paris recommend that more extensive, detailed research be conducted in the area

of metacognition and reading to benefit both researchers and educators. They state: "Of course, the ultimate test of the value of the construct is whether or not it helps students read better" (Jacobs & Paris, 1987, p. 257).

The majority of the research studies conducted in the area of metacognition and reading have focussed on the executive processes and strategy use. Although these are essential to the reading process, the importance of metacognitive knowledge cannot be ignored.

Forrest-Pressley and Waller (1984) describe the relationship between metacognitive knowledge and the executive processes:

The knowledge that the reader has about the cognitive strategies may affect how he or she approaches the reading task.... In addition, the child needs to monitor progress. The reader must realize when important information is read, decide whether or not the purpose of reading is being achieved and determine if a change in strategy is needed.... If the reader recognizes comprehension failure, it follows that the reader's knowledge about various reading strategies and the efficiency of each should affect subsequent behavior. (p. 126)

An awareness of reading strategies precedes the actual implementation of such strategies (Short & Ryan, 1984).

Yet, the studies in this area have been limited. Although a

relationship between strategy awareness and strategy use has been reported (Palincsar & Brown, 1987b), the research on metacognitive knowledge and performance is less convincing than that of executive processes and performance (Lawson, 1984).

From the review of the research, metacognitive knowledge differences between skilled and unskilled readers have been found. However, few studies have measured the relationship between students' metacognitive knowledge and their reading performance or have examined specific types of metacognitive knowledge (Paris & Myers, 1981; Jacobs & Paris, 1987). The research studies investigating metacognitive awareness about reading have, for the most part, described metacognitive knowledge or awareness in general terms. Paris's research has examined general types of metacognitive knowledge: declarative, procedural, and conditional knowledge. Not only is knowing about strategies (declarative knowledge) and knowing how they work (procedural knowledge) important, but knowing when and why to use them (conditional knowledge) is critical (Paris et al., 1983).

Pressley, Goodchild, Fleet, Zajchowski, and Evans (1987) explain:

If students are to employ a strategy consistently and skillfully, they must know the value of the procedure as well as when and where to use it....

This type of knowledge plays an absolutely critical role in the autonomous use of strategies. (p. 10)

Many studies investigating metacognitive knowledge have not examined conditional knowledge.

In addition, the majority of the metacognitive reading awareness studies have focussed on good and poor readers utilizing the interview format. Within the context of the regular classroom there is a wide continuum of student reading ability. Very few studies have contrasted three groups of learners (high, middle, and low). Such grouping provides more specific information about a wider range of learners within the regular classroom. Not all learners can be classified as good or poor. The "average" group which comprises a large portion of students in the regular classroom cannot be ignored.

The interview format has been a widely used methodology in metacognitive knowledge research. However, the use of interview data has been criticized by Garner (1987) and other researchers. Some of the problems with verbal reports, outlined by Garner (1987), include: inadvertant cueing, hypothetical situations, memory, accessibility, strategy use, and language skills. Within an interview situation the interviewer may unknowingly provide either general or direct probes. Students may guess at a response or respond according to what they think the interviewer

expects. Although hypothetical questions are frequently asked in interviews, many students have not yet acquired the ability to abstract hypothetical situations which is a late-developing skill (Baker & Brown, 1984b).

According to Garner, when students are asked about a cognitive process, they may possess the knowledge about that process but could fail to reveal this for a number of reasons. They may fail to remember knowledge about strategies, particularly the greater the interval of time between the strategy use and the verbal report. Some cognitive processes or knowledge may be inaccessible, as these could occur automatically. In contrast, students may be able to provide the interviewer with details about the processing although they are unaware of how it works. Furthermore, students may be able to state or identify the specific strategies to be used, although they do not apply these strategies to the reading process.

Perhaps one of the major criticisms of interviews, as discussed by Garner, is their dependence upon an individual's verbal facility. What appears as a "deficit" in students' metacognitive knowledge could be due to a lack of the language skills necessary to verbalize the cognitive processes. Therefore, verbal reports may inaccurately reflect what students know. Although the interview format has the advantage of using student generated responses, the stated limitations cannot be ignored.

In an attempt to overcome some of the difficulties associated with interview data, this research study has utilized the Index of Reading Awareness (IRA) questionnaire. Jacobs and Paris (1987) outline several advantages of this instrument over the interview probe. First, the multiple-choice format provides a more objective measure than does the interview which is subject to the interpretation of responses or experimenter bias. Secondly, the Index of Reading Awareness can be easily administered and scored. Thus, it allows for a large sample of students to be assessed. Thirdly, the Index of Reading Awareness has the distinct advantage of reflecting more accurately differences in student's metacognitive knowledge rather than differences in their verbal ability. Finally, the questionnaire is an instrument that is sensitive to age-related differences in reading awareness.

In summary, many studies have demonstrated that instruction in strategies improves students' use of strategies. Despite the recognition of metacognitive knowledge as an important component in the reading process, few studies have explored this relationship. The majority of research conducted in this area has focussed on metacognitive knowledge differences between good and poor readers, utilizing the interview format. Previous studies have failed to define reading strategy awareness in specific terms as do Jacobs and Paris (1987). In addition, few

studies have investigated the differences in metacognitive knowledge about reading with gifted, average, and learning disabled students.

Further studies investigating metacognitive reading strategies are needed to assist researchers and teachers (Jacobs & Paris, 1987). In order to develop and implement effective programs, researchers and educators require a greater understanding of the metacognitive reading strategies employed by learning disabled, average, and gifted students. By learning more about reading awareness for different students, instructional methods can be tailored to meet the needs of various learners. This thesis proposes to provide more extensive, specific research in metacognitive knowledge about reading strategies.

Purpose of the Study

The present study is designed to investigate the differences of reading strategy awareness in gifted, average, and learning disabled students, who attend regular classes at the grade four level. The study will focus on four aspects of metacognitive reading strategy awareness, as defined by Jacobs and Paris (1987): evaluation, planning, regulation, and conditional knowledge. Furthermore, the relationship between students' reading strategy awareness

and their reading comprehension performance will be examined.

Research Questions

More specifically, the following research questions will be addressed:

1. Are there any differences in overall reading strategy awareness between gifted, average, and learning disabled grade four students?
2. What are the reading strategy awareness differences between gifted, average, and learning disabled, grade four students in each of the four areas: evaluation, planning, regulation, and conditional knowledge?
3. What is the relationship between fourth grade students' awareness of reading strategies and their reading comprehension performance?

Definition of Terms

Definitions of the terms most pertinent to this study will be briefly summarized as follows. These terms are expanded upon further in Chapter Three.

Metacognition

Metacognition refers to the knowledge of one's own cognitive processes and the consequent regulation of these processes (Flavell, 1976).

Metacognitive Knowledge

Metacognitive knowledge is defined as the accumulated and stored knowledge about the interaction of factors which affect an individual's cognitive functions. Metacognitive knowledge consists of person, task, and strategy variables and occurs as an interaction among these three variables.

Reading Strategy Awareness

Reading strategy awareness is one specific type of metacognitive knowledge involved in the reading process. Reading strategy awareness refers to the acquired knowledge about reading strategies which is effective in achieving various reading goals. It consists of four components: evaluation, planning, regulation, and conditional knowledge. In essence, reading strategy awareness is metacognitive knowledge about reading strategies.

Evaluation

Evaluation refers to an individual's assessment of oneself and the related activity. It includes the

assessment of one's present knowledge, one's own resources, and the goals of the task.

Planning

Planning refers to the selection of a particular reading strategy to achieve a specific goal.

Regulation

Regulation involves the monitoring of one's own strategies according to the nature of the task and one's progress. It allows the individual to make appropriate adjustments on this basis.

Conditional Knowledge

Conditional knowledge refers to the knowledge of the conditions that affect learning; knowing when to use a particular strategy and why that strategy would be effective. It provides the rationale for executing various strategies.

CHAPTER III

REVIEW OF THE LITERATURE

The purpose of this chapter is to provide a theoretical framework for metacognitive knowledge in reading and to review relevant research in this area. An overview of metacognition will be presented in an attempt to provide some clarity to the term. The components of metacognition will be discussed adhering closely to Flavell's (1979, 1981) conceptualization, as much of the research in metacognition makes reference to this view of metacognition. This will be followed by a presentation of some more specific conceptualizations of metacognition which provide the theoretical framework for this thesis. Since metacognitive knowledge is the focus of this research study, the emphasis of the related research will be on reading strategy awareness in reading among various learners.

Theoretical Framework

Metacognition Defined

During the past decade, metacognition has become a popular term in cognitive psychology. However, popularity and extended usage does not presuppose a clarity of definition. Metacognition is often referred to as a "fuzzy concept" (Flavell, 1981; Garner, 1987). This arises from the various definitions and the lack of agreement in the

uses of the term (Garner, 1987; Forrest-Pressley & Waller, 1984). According to Garner (1987), it is this very popularity of metacognition that is the source of the difficulty and has resulted in the distortion, vagueness, and abuse of the term metacognition. Although defining and describing metacognition is not an easy task, to do so is absolutely critical in both research and in educational practice. In research, it allows for the identification of the metacognitive strategies and processes utilized by effective learners. In practice, a greater understanding of metacognition is necessary so that metacognitive skills can be measured, instructional goals can be set and the effectiveness of training programs can be assessed (Chipman & Segal, 1985).

Metacognition is a superordinate term that refers to the thinking that is 'meta' or 'beyond' cognition (Slife, 1987). Metacognition and cognition are related, yet distinct. Cognition refers to using acquired knowledge, processes or skills such as remembering, understanding, and perceiving. Metacognition refers to the understanding and awareness of this knowledge and the conscious self-control over the cognitions, processes, or skills (Baker & Brown, 1984b; Stewart & Tei, 1983). Bondy (1984) further clarifies this distinction: "The difference between cognition and metacognition is a difference in self-awareness and control. Whereas cognitive processes may occur automatically and

subconsciously, metacognitive processes involve a conscious monitoring and regulation" (p 234).

In essence, metacognition is "thinking about thinking" (Babbs & Moe, 1983, p. 423). It encompasses such areas as: 'metamemory', 'metalanguage', 'metacomprehension', and 'metaperception' (Garner, 1987, p.16; Weinert, 1987, p.7). The magnitude of the concept is illustrated by the fact that practically any cognitive process can subsume a meta (Gavelek & Raphael, 1985).

The origins of metacognition began with Flavell, who first used the term metamemory to refer to "knowledge about one's own memory" (Garner, 1987, p.16). Later, Flavell stated: "Metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them" (Flavell, 1976, p. 232). "Metacognition can be differentiated into metacognitive knowledge and metacognitive experience, and one can distinguish between metacognitive and cognitive strategies" (Flavell, 1981, p.38).

Since this time, numerous researchers have attempted to define metacognition. Baker and Brown (1984b) describe metacognition as the "knowledge about cognition and regulation of cognition" (p. 353). Similarly Lawson (1984) refers to the components of metacognition as being metacognitive knowledge and control of cognition. According to Jacobs and Paris, metacognition is a process that focuses

on a person's knowledge about the learning situation and the application of that knowledge to activities (Jacobs & Paris, 1987). The similarity between the above definitions with Flavell (1979) lies in that metacognition includes both knowledge about and regulation of one's cognitive processes. However, uniqueness in terms of the components do exist between them.

Metacognitive Components: Knowledge, Experiences, Goals, and Strategies/Actions

Metacognitive knowledge, metacognitive experiences, strategies, and cognitive goals are four basic concepts involved in metacognition. Metacognitive knowledge serves as the basis for metacognitive experiences (Garner, 1987). These two major components of metacognition will be elaborated upon. A discussion of strategy use and cognitive goals will follow.

Figure 1: Flavell's Metacognitive Model

Figure omitted due to copyright restriction.

(Flavell, 1981, p.40)

The arrows indicate an interaction among these four components.

Metacognitive Knowledge - Metacognitive knowledge

consists of person, task, and strategy variables. Person variables refer to the knowledge and beliefs a person has about oneself. Person variables include "intraindividual differences, interindividual differences, and universals of cognition" (Flavell, 1979, p. 907). Respective examples follow. A person may know that: he/she comprehends material better by taking notes while reading, a friend is more proficient in mathematics than language arts, and people generally learn more effectively when interested in a particular topic.

Task variables are concerned with two components: knowledge about the information encountered during the cognitive enterprise and knowledge of the task demands. A reader's knowledge that the time required to read and comprehend is dependent upon the familiarity with a topic is an example of the former task category. Knowing that it is easier to recall the main idea of a passage than the specific wording is an example of the latter category.

Strategy variables encompass acquired knowledge about the strategies which would be effective in achieving various cognitive goals or solving problems. Re-reading when one does not comprehend a passage is an example of a strategy variable. Metacognitive knowledge occurs as an interaction between the person, task, and strategy variables.

Metacognitive knowledge is late-developing. It requires the individual to be aware of and to reflect on his/her cognitive processes. This awareness and reflection or "knowledge about cognition" is a pre-requisite to taking actions within a learning situation. (Baker & Brown, 1984b; Brown, Bransford, Ferrara, and Campione, 1983).

Metacognitive Experiences - Metacognitive experiences, a second major component of the metacognitive domain, are affective or cognitive conscious experiences such as thoughts, ideas, sensations, and feelings that relate to a cognitive enterprise (Flavell, 1979, 1987). These include both fully conscious and less conscious experiences and can be either complex or simple in nature. They can occur before, during, or after an intellectual enterprise (Flavell, 1979, 1985). Such experiences are most likely to develop in situations where a high degree of conscious thinking is required and are often related to one's progress towards a goal (Flavell, 1979). Thus, it is when the cognitive processing fails that the metacognitive experiences become apparent (Garner, 1987). The 'tip of the tongue' (Flavell & Wellman, 1977, p.11) phenomenon of failing to retrieve the information at the moment although knowing one knows the answer is one example of a metacognitive experience. A feeling of puzzlement regarding one's comprehension of a passage is another. (Garner, 1987).

Metacognitive experiences or "regulation of cognition" (Baker & Brown, 1984b, p. 353) refer to the self-regulated processes used by the learner to achieve cognitive goals. These include employing a remedial strategy or knowing what to do in the event of cognitive failure (Baker & Brown (1984b); Brown, et al., 1983). Whereas knowledge about cognition is stable, regulation of cognition skills are not necessarily stable, depending on the age of the child and the difficulty or nature of the task itself. (Brown et al., 1983). Metacognitive experiences can modify metacognitive knowledge by adding to, deleting, or revising that knowledge. In doing so, that knowledge may be integrated with previous knowledge about the instruction and may be stored (Flavell, 1979, 1981).

Cognitive Goals or Tasks - Goals or tasks, the third component of the metacognitive model, refer to the specific implicit or explicit objectives of the cognitive endeavor. They involve the information that initiates or maintains the actual performance. In a reading situation, these cognitive goals provide the purpose for the reading and differ with the various reading or learning activities. The diversity among the goals may range from cognitive endeavors appearing to have no apparent goal (e.g. daydreaming) to a less clearly defined goal (e.g. reading for pleasure) to an explicitly defined goal (e.g. reading for the main idea in preparation for an exam) (Flavell, 1981). Metacognitive

knowledge, metacognitive experiences, and strategies all affect the cognitive goals. However, it is the cognitive strategies that appear the most obviously influenced by the goals. The type of strategy employed will be dependent on one's cognitive goal.

Strategies or Actions - Strategies or actions, the last component of the model, refers to the cognitive processes or behaviors utilized to achieve the goals or tasks. For example, a student may reread a passage to clarify his/her understanding. Strategies utilized for the purpose of advancing cognitive processes are referred to as cognitive strategies (eg. reading, verbal rehearsal to assist one's recall) (Flavell 1979, 1981, 1985). Strategies employed for the purpose of monitoring progress are referred to as metacognitive strategies. Examples include skimming a passage to determine the difficulty, paraphrasing, or self-questioning to check one's comprehension of the material read.

A strategy may be cognitive in one case and metacognitive in another. For example, the strategy of self-questioning for the purpose of improving one's knowledge would be considered cognitive. If the purpose was to monitor how well one was learning the material it would be considered a metacognitive strategy (Flavell 1979, 1981). Re-reading, summarizing, notetaking, mapping,

self-questioning, and verbal rehearsal are a few examples of strategies which can be both cognitive and metacognitive.

Self-Appraisal of Cognition and Self-Management of Thinking

Numerous researchers and theorists have made valuable contributions to metacognitive research. The work of Paris and his associates has been significant in that they have completed some extensive, long term research in the area of metacognition and reading.

Although other theorists and researchers have investigated and discussed metacognition, few have defined it specifically. Jacobs and Paris (1987) provide a more specific and restrictive definition of metacognition. They define it as "any knowledge about cognitive states or processes that can be shared between individuals" (p. 258). Unlike Brown (1982), who suggests that metacognition is often automatic and not necessarily a conscious state, Jacobs and Paris describe conscious awareness and reportability of metacognition as a key criterion in the definition. They state that this definition ensures that metacognition can be observed and measured restricting the possibility of making inaccurate inferences about whether or not it is occurring.

Jacobs and Paris (1987) describe metacognition as a simple hierarchical construct comprised of two broad

categories, "self-appraisal of cognition" and "self-management of thinking" (p. 258). These two categories may be paralleled to Flavell's metacognitive knowledge and metacognitive experiences or Brown's knowledge about cognition and regulation of thinking. Each of these are further subdivided into three subcategories.

Self-appraisal of cognition refers to a person's assessment of his or her knowledge about a particular task or domain. It consists of declarative, procedural, and conditional knowledge. These components allow the student to select various actions or behaviors to meet a particular goal or purpose. (Paris et al., 1983).

Declarative knowledge involves 'knowing that' information relates to formulating goals and adjusting courses of action. For example, with respect to reading, a student may know that background experience influences comprehension and reading speed, or that reading for meaning involves use of context clues.

Procedural knowledge is the awareness of the thinking processes and 'knowing how' actions are carried out. Knowing how to identify the main idea, how to skim, and how to use context clues are examples of procedural knowledge a student might use.

Conditional knowledge refers to the knowledge of the conditions that affect learning; knowing when to use a particular strategy and why that strategy would be

effective. It involves adjusting one's behavior with respect to various task demands. For example, a student may know why skimming is important and when to use skimming or why paraphrasing is an important skill and when to use it rather than another strategy to aid comprehension (Jacobs & Paris, 1987)... Conditional knowledge provides the rationale for executing various strategies or actions.

According to Jacobs and Paris (1987), self-management of thinking is often referred to as self-regulated thinking or executive control of behavior. It involves the application of knowledge into actions or task activities. The processes of evaluation, planning, and regulation comprise this category.

Evaluation refers to an individual's assessment of oneself and the related activity. It includes the assessment of one's present knowledge, one's own resources for the task, and an assessment of the goals or subgoals of the task. Evaluation is a continuous process. For example a student can assess comprehension of material during the reading process as he or she pauses, reflects, summarizes, or answers questions about a topic (Marzano et al., 1988).

Planning is defined as, "the selective coordination of a cognitive means to a cognitive goal" (Jacobs & Paris, 1987, p. 259). This involves selecting a particular strategy to achieve a specific goal or purpose. One example

of a planning strategy is a student adjusting the rate of reading depending on the purpose of the reading task.

Regulation involves the monitoring of one's own strategies according to the nature of the task and the individual's progress. It allows the individual to make appropriate adjustments on the basis of the nature of the task and on one's own progress. Regulation is an ongoing process. For example, while reading a student notes that he/she had difficulty understanding a passage and therefore goes back and rereads the passage more slowly (Jacobs & Paris, 1987).

The regulation component as described by Jacobs & Paris, 1987) is similar to what Baker and Brown (1984a) define as metacomprehension or comprehension monitoring: "Comprehension monitoring entails keeping track of the success with which one's comprehension is proceeding, ensuring that the process continues smoothly and taking remedial action if necessary" (p. 22). Comprehension monitoring involves two components. The first is an awareness or monitoring of one's ongoing comprehension. This refers to the awareness of various aspects of reading and one's reading comprehension processes or failure to understand. The second aspect refers to the employment of a self-regulatory mechanism to direct one's comprehension. It involves the use of appropriate strategies when one fails to comprehend (Baker & Brown, 1984a; Wagoner, 1983).

Jacobs and Paris describe metacognition in terms of a taxonomy of self-appraisal of cognition and self-management of thinking with three components in each category. They state that their definition focusses on "public knowledge about cognitive activities" (Jacobs & Paris, 1987, p. 259) to be shared by teachers and students in an interactive learning environment. Jacobs and Paris emphasize that their definition of metacognition is not the goal of education but rather a means to an end that is functional in completing tasks and in solving problems.

Although a clarification of terms is important, the purpose of this thesis is not to define terms, but rather to use the definitions as a means of achieving a greater understanding of children's metacognitive processes involved in reading comprehension.

Review of Related Research

A recognition of the importance of the metacognitive aspects of reading has led to numerous related research studies in recent years. This section of the chapter will focus on recent research investigating metacognitive knowledge differences in various learners and the relationship between metacognitive knowledge and reading comprehension performance.

Within the context of the regular classroom there is a wide continuum of student reading ability. In attempting to teach strategic behavior, individual differences of the students have been frequently neglected (Borkowski, Weyhing, and Turner, 1986). In order to provide for the most effective instruction in reading strategies, it is important to investigate metacognitive reading awareness in the context of the wide range of students within the regular classroom.

The review of the research will be presented according to the following categories: the skilled and unskilled; the learning disabled; and the gifted students. In keeping with Garner's distinction, the terms 'good' or skilled readers and 'poor' or unskilled readers will be utilized to "indicate a contrast between two points on a continuum of reading proficiency" (Garner, 1987, p. 31). These terms are frequently used in the research literature.

Metacognitive Knowledge Differences Between Skilled and Unskilled Readers

The differences between skilled and unskilled readers have been discussed by numerous researchers and theorists. Among the identified characteristics of skilled readers are that they actively monitor their understanding (Bristow, 1985). They are aware of when, how, and why to use various strategies to assist their comprehension (Paris & Oka, 1986)

and they apply strategies such as self-monitoring, planning, and checking for understanding (Paris & Jacobs, 1984). Good readers have been noted to utilize context clues and make spontaneous corrections while reading orally (Bristow, 1985). They employ other active strategies such as predicting, skimming, questioning, evaluating, strategic reading, and focussing on main ideas (Brown & Campione, 1986).

On the other hand, poor readers are more passive readers who often do not use active strategies to monitor their comprehension. (Brown & Campione, 1986; Schewel & Waddell, 1986; Bristow, 1985). Palincsar and Brown (1987a) describe unskilled readers as failing:

(a) to conceptualize reading as a search for meaning as opposed to a decoding task, (b) to monitor their comprehension to determine if they are deriving meaning (c) to engage in strategic behavior that will bring meaning to a text or restore meaning if there has been a breakdown in comprehension and (d) to modify their choice of strategies to meet the variable demands of reading. (p. 95)

Although numerous studies have investigated the differences between good and poor readers, fewer studies have assessed learner's metacognitive knowledge about reading.

Modelled after a metamemory study by Kr  tzer, Leonard, and Flavell (1975), Myers and Paris (1978) conducted a study investigating second and sixth graders' metacognitive knowledge of reading. Utilizing a multi-item interview format, students' awareness of person, task, and strategy variables were assessed. Results revealed that the older students were significantly more aware of the many important reading aspects than were the younger students. Sixth graders were more aware of: the characteristics of good readers, the motivational variables affecting reading, specific task dimensions related to the semantic features of the text, and the reading strategies necessary for various reading goals and materials.

The older students reported a greater understanding and employment of strategies for monitoring their comprehension progress and resolution of their comprehension failures. Both groups of students were aware of the influence of passage length, background experience, and interest in reading. In general, the younger students focussed on the decoding aspects of reading while the older students were aware of the comprehension aspects.

Canney and Winograd (1979) reported similar findings in a study investigating students' conceptions about reading. Students in grades two, four, six, and eight were administered an interview questionnaire followed by structured reading passages assessing their metacognitive

knowledge about the nature and goals of reading. Utilizing five passages ranging from intact to systematically altered (syntactically, semantically, and lexically), students were asked to determine how readable each passage was. Canney and Winograd reported that older and more proficient readers were more aware of the meaning-oriented aspects of reading while the younger and poorer readers were more concerned with the decoding aspects. The researchers reported an apparent relationship between the students' awareness about reading for meaning and their level of comprehension.

Expanding their research focus from metacognitive knowledge to include metacomprehension, Paris and Myers (1981) conducted two experimental studies. They compared the comprehension, memory, and comprehension monitoring skills of good and poor fourth grade readers.

In the first study, students' comprehension monitoring was assessed by their spontaneous use of self-correction during oral reading and by having them underline words and phrases that they did not understand. Results indicated that poor readers did not monitor their comprehension as frequently or as accurately as the good readers. As anticipated, the poor readers' recall and comprehension on silent and oral reading passages was inferior to that of the good readers.

In the second study, comprehension monitoring was assessed through the use of study behaviors (questions,

notes, and dictionary use). Metacognitive knowledge about effective and ineffective reading strategies of good and poor readers was compared. Findings indicated that although good and poor readers did not differ in their study time, the good readers demonstrated more spontaneous comprehension strategy use for unfamiliar words than did the poor readers. Upon reading and recalling a story, poor readers rated negative reading strategies higher (more useful) than did the good readers. Thus, poor readers were less aware than the good readers of the detrimental variables that affect reading comprehension and recall.

Comprehension monitoring was significantly correlated with reading performance differences. The poor readers response patterns suggested that they were concerned with the decoding rather than comprehension aspects of reading and were less effective in applying comprehension monitoring skills to resolve comprehension failures. In summary, poor readers were characterized by their lack of awareness, strategy use, and recall of stories.

Recognizing that little attention had been focussed on the relationship between metacognitive knowledge and reading performance, Moore and Kirby (1981) set out to address this question. Their research was based on replicating and extending the Myers and Paris (1978) study to include within-grade differences. Moore and Kirby reported that high ability sixth graders were more aware of focussing on

key words while skimming than were their low ability counterparts. High ability second graders differed significantly from the low ability group in that they reported teacher selected texts to be easier to remember than self-selected texts. Similar to Myers and Paris (1978), the researchers found the older students to be more aware of readers' goals, task dimensions, and strategy variables than were the younger students.

In a later study, Moore (1983) investigated the metacognitive knowledge development in reading and the relationship of children's metacognitive knowledge to reading performance. Two different interview formats were utilized. Subjects were high and low ability readers across three different age groups (six, eight, and ten year olds). Results indicated that the high ability readers were more metacognitively aware than were the low ability readers of many of the important reading parameters. These included person-oriented responses, task dimensions, and strategy variables. The greatest increase in metacognitive development occurred between the age of six and eight years. Asking direct questions through the interview schedule was found to be a more effective method of obtaining information than was asking questions after a hypothetical dialogue.

Garner and Kraus (1981-1982) used an interview to examine the differences in reading awareness of poor and good readers in the seventh grade. Two weeks later, an

error detection task was administered to assess student comprehension monitoring performance. The latter task involved students reading two narrative passages which included either within-sentence or between-sentence informational inconsistencies.

With respect to knowledge about reading, the good comprehenders' responses focussed on meaning as the critical component of the reading process. The poor comprehenders reported oral reading fluency and decoding as the critical factors in reading. Differences between the two groups were also noted in the error detection task. Good comprehenders were very successful at detecting intra-sentence inconsistencies and somewhat successful in detecting inter-sentence inconsistencies. In contrast, poor comprehenders failed to note inconsistencies in the passages read. Thus, the results indicated that good reading comprehenders demonstrated more knowledge about the reading process and monitoring of their reading comprehension than did the poor comprehenders.

Raykovicz, Bromley, and Mahlois (1985) investigated the metacognitive views about the tasks and strategies of reading held by good and poor fifth grade students. Both good and poor readers reported reading for overall meaning to be easier than reading for specific details. Likewise, both groups viewed one's background experiences as an aid to reading comprehension. However, there were many measurable

differences between the two groups. The good readers generally: perceived reading as enjoyable, preferred silent to oral reading, required minimal external guidance or reinforcement, and were self-motivated to read. They reported using intuition, memory, and visual images to aid their comprehension.

In contrast, poor readers viewed reading as a school task requiring external guidance and reinforcement. They generally did not enjoy reading and preferred reading aloud or did not state a preference for oral versus silent reading. Poor readers did not report using mental images to aid comprehension, nor did they attempt to use independent strategies to understand sentences or paragraphs.

The research reviewed thus far has involved two groups of learners: the good and the poor readers. Although this has been the sample in the majority of metacognitive studies in reading, a few researchers have investigated three groups of learners. This research will be reviewed next.

Forrest-Pressley and Waller (1984) conducted a large scale study investigating the metacognitive aspects of reading. Their sample consisted of poor, average, and good readers in the third and sixth grades. Student's metacognitive knowledge, monitoring of performance, and strategy use were examined along the reading dimensions of decoding, comprehension, and strategic reading. The interview format and performance measures were used in the

study. The younger/poorer readers experienced difficulty in monitoring their progress and in utilizing appropriate corrective strategies. For example, although the younger/poorer readers were able to recognize that a correct item made sense, the same readers had difficulty recognizing errors. When an error was noted, the younger/poorer readers had difficulty in knowing how to correct it. Older/better readers were more aware of comprehension strategies in the event of comprehension failure. In addition, the older/better readers were more likely to monitor their comprehension and were more likely to adjust their reading according to their purpose than their younger/poorer counterparts.

In general, the results revealed that both the students' reading awareness and their performance on decoding, comprehension, and reading strategies increased systematically with reading ability and with grade. Reading ability was predicted more accurately by the performance than the verbalization measures. The researchers concluded that an apparent relationship exists between metacognitive knowledge and strategy use in reading.

In a more recent study, Wong and Wong (1986) investigated the metacognitive knowledge about text organization and vocabulary difficulty with respect to students' study behaviors. Subsequently, students demonstrating high metacognitive knowledge were contrasted

with those demonstrating poor metacognitive knowledge along the dimensions of comprehension, recall, and study time. Above average, average, and learning disabled students in grades five through seven were assessed in an interview format.

As anticipated, the above average students demonstrated a significantly higher metacognitive awareness of passage organization and vocabulary difficulty on studying ease than did the learning disabled or average students. The above average readers' performances on the comprehension questions and on recalling of passage ideas were higher than the learning disabled readers. No significant differences were found between the above average and the average readers or the average and learning disabled readers in this area. Comprehension scores for all three groups of students were highest on the easy vocabulary passage and their recall was the greatest on the organized passage. The above average readers spent the most time studying the disorganized passage, whereas the learning disabled readers spent the longest time studying the difficult vocabulary passage. The results indicated that only the above average students possessed metacognitive knowledge about passage organization. The learning disabled students were viewed as possessing metacognitive awareness in reading with respect to vocabulary difficulty. The latter finding challenges previous research studies which have assessed learning

disabled students to have a metacognitive deficiency in reading. Wong and Wong stated that further research into the area of metacognition and reading is necessary.

Two metacognitive research studies, conducted by Paris and Jacobs, are particularly relevant to the present investigation. As part of a large research study, Paris and Jacobs (1984) investigated the relationship between metacognitive reading awareness and reading comprehension skills of third and fifth grade students. A second purpose of the study was to examine the effects of reading strategy instruction on students' reading awareness and use of reading strategies. A metacognitive interview modified from an earlier study (Myers & Paris, 1978) was used to assess the students' reading awareness of tasks and strategies in three general categories: planning, evaluation, and regulation. Reading comprehension was measured by error detection tasks, cloze passages, and the Gates MacGinitie Reading Test. One half of the subjects received classroom instruction over a four-month period in the use of reading comprehension strategies. The goals of the instructional program were to increase students' reading strategy awareness in procedural, declarative, and conditional knowledge.

Pretest and posttest results revealed significant correlations between metacognitive knowledge about reading and reading comprehension skills for students at both grade

levels. As was expected, fifth grade students' performance on both awareness and reading comprehension was superior to third grade students. Students in the experimental classrooms scored higher on reading strategy awareness and on comprehension than did the control groups.

To further examine the individual differences of student reading awareness and reading skills, Paris and Jacobs divided students into three groups of low, middle, and high reading awareness. Findings indicated that a higher reading awareness level was associated with higher reading comprehension. Significant pretest correlations between the three comprehension measures and metacognitive reading awareness were modest (ranging from .24 to .40). The researchers concluded that this study provides support for the importance of metacognition in reading and has direct applications for reading instruction. Instruction in reading strategy use can enhance students' reading awareness and their reading comprehension skills.

Jacobs and Paris (1987) reported an extensive longitudinal research project, involving the development and assessment of an instructional program called, "Informed Strategies for Learning" (ISL). One of the objectives of their research was to assess the relationship between students' reading strategy awareness and their reading skills. A second goal was to develop an instrument to measure students' metacognitive knowledge about reading in

order to assess the effects of instruction. 801 fifth grade and 783 third grade students from 18 schools participated in the research study. The Index of Reading Awareness (IRA), an informal inventory was designed to assess reading awareness and to determine the effectiveness of the experimental reading program. The Index of Reading Awareness, a twenty item, multiple-choice metacognitive test, was derived from a metacognitive interview used in a previous research study (Paris and Jacobs, 1984). Evaluation, planning, regulation, and conditional knowledge were the four aspects of metacognitive awareness measured by the Index of Reading Awareness. Pretest scores on the Gates MacGinitie Reading Comprehension Test were used to divide students into high, medium, and low reading groups.

Results indicated that the Index of Reading Awareness is an instrument sensitive to discriminating reader differences. Good readers demonstrated greater reading awareness than did poor readers. Fifth grade students exhibited more awareness of the important aspects of reading than did the third grade students. The data provided clear evidence that metacognitive instruction about reading improves student reading strategy awareness and understanding.

All students who participated in the instructional program made gains in reading awareness and comprehension strategies, regardless of their reading ability levels. The

study indicated that students' metacognitive knowledge and their effective strategy use in both grades and across all reading levels was promoted by the instructional program.

In summary, the research studies found older and more proficient readers to perceive reading as a meaning-oriented task, whereas the younger and poorer readers focussed on the decoding aspects of reading. Older and better readers were more metacognitively aware of the comprehension aspects of reading along the person, task, and strategy dimensions. In addition, they reported attempting to utilize strategies for monitoring comprehension more frequently than did their younger and poorer counterparts. Furthermore, the research findings indicated that a relationship exists between metacognitive knowledge and reading comprehension. - Student reading awareness and comprehension increased with reading level and with grade.

Metacognition and Learning Disabled Readers

While the majority of research studies conducted with respect to metacognitive knowledge and reading have been with good and poor readers, learning disabled students have also been a target group for research in the area of metacognition and reading. The studies conducted with learning disabled students have, for the most part, investigated the executive processes and strategy training as opposed to metacognitive knowledge. Borkowski, Weyhing,

and Carr (1988) describe the learning disabled students as: " ...inactive, less planful, disorganized, and lacking the skills and strategies necessary to prosper in classroom environments" (p.46). Among the studies investigating training learning disabled students to use reading strategies are those of Wong and Jones (1982); Clark, Deshler, Schumaker, Alley, and Warner (1984); Bos and Filip (1984); Chan and Cole (1986); Chan, Cole, and Barfett (1987).

Hypothesizing the lack of comprehension monitoring skills to be one of the causes of comprehension difficulties in learning disabled students, Wong and Jones (1982) investigated the effects of teaching learning disabled students to monitor their reading comprehension through self-questioning training. One-half of the eighth and ninth grade learning disabled and average sixth grade students who participated in the study were trained in a five-step self-questioning procedure designed to enhance metacomprehension. Results indicated that the learning disabled adolescents who received training demonstrated increased awareness of the important elements of text. Training facilitated their ability to formulate questions related to the textual units and improved their reading comprehension. However, the training did not significantly increase the comprehension or metacomprehension performance of the average sixth graders. Wong and Jones concluded that

the lack of metacomprehension skills is one cause of the comprehension problems of learning disabled adolescents. According to the researchers, the results support the theoretical view of the passive nature of learning disabled students.

With the purpose of enhancing reading comprehension, Clark et al. (1984) taught learning disabled adolescents visual imagery and self-questioning strategies. The visual imagery strategy required students to form a visual image based on a passage read. The self-questioning strategy required students to formulate questions while reading in order to facilitate recall and maintain interest. Results indicated that the learning disabled students were able to learn both reading comprehension strategies. The application of the visual imagery and self-questioning strategies resulted in increased performance in reading comprehension scores. The authors concluded that teaching learning strategies can increase reading comprehension.

Chan and Cole (1986) examined the effects of metacognitive strategy training on reading comprehension. Learning disabled students (aged ten and twelve years) and regular class third grade students were taught the comprehension monitoring strategies of self-questioning and underlining relevant text. These strategies required the ability to reflect on the meaning of the text and to monitor one's understanding while reading. The learning disabled

students trained in the metacognitive strategies demonstrated significant improvement in reading comprehension scores compared with the students who did not receive instruction. This was demonstrated across all three experimental conditions which involved: self-questioning only condition, underlining only condition, and self-questioning and underlining condition.

In contrast, the regular class students did not demonstrate a significant difference between the control and experimental conditions. The lack of significant improvement in comprehension scores by the trained regular class students was attributed to their spontaneous use of strategies in reading comprehension. Similar to the findings of Wong and Jones (1982), this research supports the view of learning disabled students as inactive learners in the reading process. Furthermore, it demonstrates the benefits of specific instruction in metacomprehension strategies for learning disabled students.

In a subsequent study, Chan, Cole, and Barfett (1987) investigated the reading comprehension monitoring skills of learning disabled students. The learning disabled students (mean age of eleven years) were matched on word recognition skills with third grade regular class students (mean age of eight years, two months). Subjects were randomly assigned to a general or specific instructional condition. All students were instructed in how to monitor for textual

inconsistencies and were informed of the presence of errors in the reading passages. Students assigned to the specific instruction condition were provided with a rationale for the inconsistencies in the text. In addition, they received explicit instruction in the use of a cross referencing technique to evaluate textual consistency.

Results indicated the learning disabled students who received specific instruction performed significantly higher in comprehension monitoring and in reading comprehension than did the learning disabled students in the general condition. In contrast, the average third grade students performed similarly across both conditions. These results supported the previous findings of the researchers, who attributed the discrepancy in performance of the learning disabled and the average students as possibly due to the chronological age differences. According to Chan et al. (1987), upon overcoming their initial production deficit, the learning disabled students had more experience and maturity and were thus able to more effectively apply the skills than the younger students. In addition, significantly high correlations were obtained between comprehension competence and comprehension monitoring measures. The learning disabled students in the specific instructional condition demonstrated superior comprehension monitoring and superior comprehension performance. This indicates that a higher achievement in reading comprehension

was associated with improved performance in comprehension monitoring.

Similar findings were reported by Boss and Filip (1984), who examined the comprehension monitoring skills of seventh grade learning disabled and average students. Students were required to read and evaluate expository passages containing inconsistencies in the text. Passages were read individually by the students under a standard condition and followed by a cued condition. The results indicated that the average students were able to detect inconsistencies in the text under both conditions. In contrast, the learning disabled adolescents identified text inconsistencies in only the cued condition.

The findings were interpreted as providing support for the researcher's hypothesis of learning disabled students being characterized by a production deficiency in comprehension monitoring for textual inconsistencies. In addition, the researchers stated the findings support Torgeson's (1977) view of the learning disabled students as inactive learners.

In summary, research has identified learning disabled students as passive learners who fail to use metacognitive skills or appropriate strategies in reading comprehension (Schewel & Waddell, 1986; Wong & Jones, 1982). When compared to average students, learning disabled students are described as having "strategy deficits" or fewer strategies

in their repertoire of skills. Although these strategies are considered to be similar to those of average students, learning disabled students are more narrow and less flexible in their use of strategies (Borkowski & Kurtz, 1987). They are frequently less able to predict their performance compared with their average achieving peers. In addition, learning disabled students are frequently unaware of the meaningful nature of sentences and the need to read for the purpose of understanding. (Canney & Winograd, 1979).

Despite their "strategy deficits", learning disabled students have been shown to achieve significant gains in reading performance after receiving strategy training (Chan & Cole, 1986; Wong, 1979; Wong & Jones, 1982). Reading for meaning is an active process which requires metacognitive awareness, comprehension monitoring, and the appropriate use of comprehension strategies. Thus, it is not surprising that these students are often low achievers in reading and can benefit from specific strategy training.

Metacognitive Knowledge in Gifted Readers

Research with the gifted students has focussed primarily on the global characteristics of this group. Generally, it has been found that the learning and memory strategies utilized by gifted students are similar to those used by average students (Borkowski & Kurtz, 1987; Scruggs, Mastropieri, Monson, & Jorgensen, 1985). However, notable

differences exist between gifted and average students in strategy awareness, strategy use, and generalization.

On metacognitive tasks and memory processes, gifted learners show deeper understanding and are more adept at verbalizing the processes used, than their average peers (Borkowski & Peck, 1986). They report a greater awareness of a larger number of strategies. Gifted learners demonstrate higher performance on more difficult tasks, including problem solving and memory tasks (Borkowski & Kurtz, 1987). Although gifted students are viewed as utilizing effective strategies in reading and as easily transferring their learning to new situations (Mitchell & Irwin, 1985), the research investigating the performance of gifted students in the area of metacognition and reading comprehension has been limited. Research in this area has been conducted by Wingenbach (1982, 1984) and Mitchell and Irwin (1985).

Wingenbach (1982, 1984) investigated metacognitive awareness and reading comprehension strategies of gifted readers. One hundred gifted students in grades four to seven were administered a metacognitive awareness questionnaire and a standardized reading test. From this sample, twenty students (five at each grade level) participated in an interview and protocol analysis.

The various comprehension strategies identified by the students were categorized as word related, context related,

or meaning related strategies. Findings indicated that gifted students demonstrated metacognitive awareness of the reading process and the use of reading strategies. Specifically they identified the strategies, providing a description and rationale for their use. The gifted readers assessed their comprehension, selecting and using specific reading comprehension strategies. Furthermore, they evaluated the effectiveness of the strategies they employed, modifying them as necessary. The differences between the students at the various grade levels in both metacognitive awareness and use of comprehension strategies was reported as minimal. The use of imagery was a strategy employed by the gifted students which had not been identified by good readers in previous research.

Mitchell and Irwin (1985) conducted an exploratory study examining the reading strategies of eighth grade gifted and regular class students. Upon reading a typical content area assignment, students were required to answer specific questions designed to assess their reading strategies. An open-ended questionnaire was utilized. The reading strategies reported by the students were classified according to four hierarchical levels reflecting the degree of interaction with the text. These included: basic strategies, organizational strategies, reacting strategies, and evaluating strategies. A comparison between the gifted and the regular class students was based on categorizing

these strategies as knowledge, usage, or instructional awareness strategies.

The gifted students reported greater frequency of reading strategy use across the dimensions of strategy knowledge, strategy use, and instructional awareness at each of the strategy levels than did the regular class students. Moreover, the gifted students rated their level of text comprehension higher than did the general population students. The researchers concluded that student reading strategy levels can be determined on the basis of their responses to specific questions.

The gifted students demonstrated more metacognitive awareness of the strategies than did their regular class counterparts. They reported a more effective use and generalization of the strategy than the instruction had provided. In contrast, the general population students either did not have the knowledge or did not use the reading comprehension strategies. The researchers stated that both groups of students could benefit from reading comprehension strategy instruction for content text. Although the gifted reported more effective strategy use, their relatively low use of higher level strategies in proportion to the basic strategies would seem to indicate that they, too, could benefit from specific strategy instruction.

In summary, the above studies appear to provide support for previous research characterizing gifted students as more

fluent and interactive in the reading process. Metacognitive awareness and specific strategy use are significant characteristics shared by gifted readers which contribute to their superior performance in reading comprehension. Despite their superior performance, they appear to benefit from reading strategy instruction.

Chapter Summary

Most definitions of metacognition refer to the knowledge about and regulation of one's cognitive processes. Flavell's conceptualization of metacognition, frequently referred to in the research, was presented. This encompasses the interaction among four components: metacognitive knowledge, metacognitive experiences, strategies, and goals. A more recent and specific conceptualization of metacognition proposed by Paris and Jacobs (1987) was discussed. This consists of two components described as self-appraisal of cognition and self-management of thinking. Declarative, procedural, and conditional knowledge are included in self-appraisal of thinking, whereas evaluation, planning, and regulation are encompassed in the self-management of thinking category.

Metacognitive knowledge is viewed as an important aspect of the reading process. The majority of research studies in this area have contrasted the skilled and unskilled readers. Skilled readers are reported to be more

metacognitively aware of the many important reading variables than unskilled readers. Older and more proficient readers demonstrated greater awareness of the comprehension aspects of reading, whereas the younger and poorer readers were primarily concerned with decoding. Good readers reported greater understanding and employment of the monitoring strategies than the unskilled readers.

Few research studies have investigated metacognitive reading awareness differences between three groups of learners or have examined the relationship between student metacognitive knowledge and reading performance. The existing research with high, middle, and low readers has reported significant differences only between the high and the low readers, but not between the three groups of learners. Furthermore, a relationship between metacognitive knowledge and reading comprehension has been obtained.

Numerous metacognitive research studies have been conducted with the learning disabled students. However these studies have almost exclusively focussed on the executive processes and strategy training. These students have demonstrated significant improvement in reading performance after receiving strategy instruction. Yet, the research with learning disabled readers in the area of metacognitive knowledge or reading awareness has been virtually non-existent. Similarly, the metacognitive knowledge reading research with the gifted readers has been

limited. The few studies conducted in this area have found gifted students to demonstrate greater awareness of the reading strategies, to be more interactive in the reading process, and to report greater strategy use than the average students.

Despite the importance of metacognitive knowledge as a prerequisite to strategy use, few studies have investigated differences in reading strategy awareness among the exceptional and average learners within the regular classroom. From the review of the literature, there is a need for research in this area. This study attempts to address this need. More specifically, the present research study proposes to investigate reading strategy awareness differences between gifted, average, and learning disabled students in the regular classroom, to examine reading strategy awareness differences in the specific areas of evaluation, planning, regulation, and conditional knowledge for these learners, and to determine the relationship between reading strategy awareness and reading comprehension performance. The research methodology designed to address these research questions will be presented in the following chapter.

CHAPTER IV

METHODOLOGY

This research study is part of a larger longitudinal study, the Cognitive Education Project, which involved the implementation and evaluation of two learning/thinking strategy programs. This chapter provides a brief description of the research design of this large scale investigation and the sample data used in the present study. Following this, the subjects, subject identification criteria, measurement instruments, and procedure will be presented.

Research Design

The large scale longitudinal research study involved two phases conducted over a three year period (Phase 1: 1984-1987; Phase 2: 1985-1988). Three instructional programs (Feuerstein's Instrumental Enrichment, Strategies Program for Effective Learning/Thinking, and Control) were implemented at two initial grade levels (grades four and seven) with three categories of students (gifted, average, and learning disabled). From the initial screening, gifted, average, and learning disabled students were identified and selection of students to be followed for a three year period was made. The entire study involved four data collection points in each phase. Pre-tests were conducted in the fall

of the initial year, followed by post-tests in the spring of each of the subsequent years.

The data for the present study is the sample of fourth grade students identified as learning disabled, average, and gifted students from the pre-test phase of this large scale investigation. This pre-test phase involved two data collection points: October, 1984 and October, 1985. This study is concerned only with the pre-test results for academic achievement and reading strategy awareness.

Subjects

One hundred thirty schools from twenty-two school jurisdictions across a wide geographic area in northern and central Alberta participated in the study. A representation from both rural, urban, and small town schools constituted the sample. The sample selection was within the regular class. 2800 fourth grade students attending regular classes were screened. From this initial screening, pretest data for 356 subjects: 116 gifted, 127 average, and 113 learning disabled students was obtained and analyzed. The sample had a very restrictive range within each of the three groups. As the interest was only regular class students, students receiving resource, enrichment, or any other special instruction were not included in the sample.

Subject Identification

Criteria for the identification of the gifted, average, and learning disabled students specified by Mulcahy, et al., (1989), are as follows:

Gifted

- (a) All students who obtained scores of 115 or higher on the verbal and the non-verbal sub-scales of the Canadian Cognitive Abilities Test (CCAT) were identified.
- (b) From this group, all students who were rated as being above average in achievement in reading and above average grade level in mathematics on the Canadian Achievement Test (CAT) were delineated.
- (c) From this group, all students who were rated by their teachers as being above the mean (of the total study population) on three of the Renzulli and Hartman's Scales for the Rating of Behavioral Characteristics of Superior Students (SRBCSS) (i.e., motivation, learning, and creativity characteristics) were included in the gifted sample.

Average

- (a) First, all students who obtained scores within one standard deviation of the mean on both the Verbal and Non-verbal sub-scales of the CCAT were identified.
- (b) Then, all students from this group who obtained achievement scores on the Reading subscale of the CAT within one standard deviation of the mean and who were within the normal range of the Mathematics sub-scale of this test were eligible for inclusion in the average sample.

Learning Disabled

- (a) All students who obtained scores within one standard deviation of the mean on both the Verbal and Non-verbal sub-scales of the CCAT were identified.
- (b) Then all students from this group, who obtained scores which were at least one standard deviation below the mean on the reading achievement of the CAT were included in the learning disabled sample.
- (c) Those students with severe behavioral problems, and/or sensory handicaps and who used English as a second language were excluded. (p. 301)

Reading was selected as a critical measure of academic achievement in the identification of the three categories of students: the gifted, average, and learning disabled. Reading is considered to be the single most important skill required for school success. Furthermore, this is the area in which the majority of learning difficulties are experienced by learning disabled students (Mulcahy, 1989).

Tests and Measures

Screening Tests

Canadian Cognitive Abilities Test (CCAT) - The Canadian Cognitive Abilities Test (CCAT), Level B, Form 3, was administered. The CCAT is a multilevel, norm-referenced aptitude test designed to measure cognitive abilities in verbal, nonverbal, and quantitative reasoning. This multiple choice, computer scored test provides IQ scores for verbal, nonverbal and quantitative scales. KR 20 reliability estimates are reported as .93 for the verbal battery, and .89 for the quantitative battery. Content validity is reported with respect to prior defined domains (Thorndike & Hagen, 1984).

Canadian Achievement Test (CAT) - The Canadian Achievement Test is a norm-referenced test measuring academic achievement across four content areas. Only the reading and math tests, Level 14, Form A, were administered.

The authors report KR 20 reliability of .94 for reading and of .93 for math. Content validity is reported to be established by category objectives designed to measure common skills of the curriculum at these grade levels (CTC/McGraw Hill Ryerson, 1983; Whyte, 1985).

Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS) - The Scale for Rating the Behavioral Characteristics of Superior Students by Renzulli and Hartman, is a teacher rating scale for identifying gifted students in grades four to six. The learning, motivation, and creativity subscales were administered. Stability reliability coefficients over a three month interval ranged from .77 to .91. Interrater reliability coefficients ranged from .67 to .91 (Argulewicz, 1985).

Index of Reading Awareness (IRA)

The Index of Reading Awareness (IRA), a multiple-choice questionnaire developed by Paris et al. (1984) to measure reading strategy awareness, is the major instrument used in this study. Student metacognitive knowledge about reading assessed by this test includes: evaluating the task and one's skills, planning for specific goals, monitoring one's reading progress and employing reading strategies to meet specific goals. The Index of Reading Awareness was designed on the basis of an earlier interview study (Paris & Jacobs, 1984) which measured the evaluation, planning, and

regulation aspects of reading awareness. Questions from these three categories were retained in the Index of Reading Awareness. Student's open-ended responses to the interview probe were reflected in the multiple-choice alternatives of the Index of Reading Awareness. Items for the fourth category, conditional knowledge, were constructed and added to the test.

In developing the Index of Reading Awareness, Paris and Jacobs (1987) provide a measure of overall reading strategy awareness and of the four basic subscales: evaluation, planning, regulation, and conditional knowledge. A description of each subscale follows. The questions of the evaluation subscale focus on the student's assessment of him/herself and of the activity. An example of an evaluation item is: "What is special about the first sentence or two in a story?" (Item #4), (Jacobs & Paris, 1987, p.268). The planning subscale consists of items involving the use of reading strategies in a planful manner. An example of a question within this subscale is: "Before you start to read what kind of plans do you make to help you read better?" (Item #14), (Jacobs & Paris, 1987, p.268). Self-monitoring while reading describes the items assessed by the regulation subscale. An example is: "What do you do if you don't know what a whole sentence means?" (Item #20), (Jacobs & Paris, 1987, p.269). The conditional knowledge subscale assesses knowledge students have regarding the use

of a specific strategy for a particular purpose. For example: "If you are reading a library book to write a book report, which would help you the most?" (Item #13); (Jacobs & Paris, 1987, p.269).

The Index of Reading Awareness consists of 22 questions with three response alternatives per item. Each question is worth 0, 1, or 2 points. The instrument provides an overall index of reading awareness with total scores ranging from 0 to 44. In this research study, the Index of Reading Awareness scores have been coded as 1, 2, or 3 rather than 0, 1, or 2. Thus, the reported total scores range from 22 to 66 points. A three point response reflects an appropriate awareness of specific strategies or goals. A response worth two points is considered adequate based on being partly strategic but not making specific reference to a particular strategy. A one point response is considered inappropriate as it is a nonstrategic response (Paris et al., 1984).

Paris et al. (1984) reported test-retest reliability on the entire test, correlation of $r = .55$, $p < .001$, after an eight-month interval for 544 third and fifth grade students. While this may appear to be a somewhat low reliability, given the length of time between the testing, this reliability score indicates some stability. No ceiling or floor effects were reported.

Some evidence for construct validity is evident through the correlation between student's performance on the Index of Reading Awareness questionnaire with the Gates MacGinitie Reading Comprehension Test. Paris and Oka (1986) reported significant pretest correlations of $r = .41$; $p < .01$ and $r = .33$; $p < .01$ and post-test correlations of $r = .37$; $p < .01$ and $r = .40$; $p < .01$ for third and fifth grade students respectively. Good readers and those students receiving instruction in reading strategies revealed greater awareness of the important reading strategy variables than did the poor readers or the control group students. This indicates the Index of Reading Awareness to be a sensitive instrument in discriminating reader differences. Although normative data has not been reported by the authors, the test scores distinguished between good and poor readers and between experimental groups receiving instruction in reading strategies and control groups (Jacobs & Paris, 1987; Paris & Oka, 1986).

Procedure

All grade four students attending regular classes from each of the one hundred thirty schools were screened using the Canadian Cognitive Abilities Test (CCAT), the Canadian Achievement Test (CAT), and the Scale for Rating Behavioral Characteristics of Superior Students (SRBCSS). The above tests were administered by the classroom teachers. The

Canadian Cognitive Abilities Test and the Canadian Achievement Test have been routinely administered by most school districts across Alberta in the spring and have a specified set of administration procedures. The Scale for Rating the Behavioral Characteristics of Superior Students was completed by the classroom teachers, following a teacher inservice given by a project researcher describing the rating scales.

All fourth grade students in each of the one hundred thirty schools were administered the Index of Reading Awareness. Teachers read the questionnaire to all students in their classrooms and the students checked their responses. Confidentiality of the test scores was ensured. Teachers volunteered to participate in any of the three instructional conditions and were then randomly assigned to one of the conditions by the research team. There was no manipulation of variables for the present study.

CHAPTER V

RESULTS

The primary purpose of this study was to investigate the differences in metacognitive reading strategy awareness of learning disabled, average, and gifted students. A secondary purpose was to determine the relationship, if any, of metacognitive reading strategy awareness (subscale and total scores) and reading achievement (vocabulary and comprehension scores).

Following a descriptive summary of students' ability, achievement and reading awareness scores, the results from two types of statistical procedures will be presented:

(1) One-way analyses of variance were conducted for the total test scores of the Index of Reading Awareness questionnaire and for each of the subscale scores: evaluation, planning, regulation, and conditional knowledge. Thus a total of five one-way ANOVAs were conducted, each of which were followed by a post hoc test, the Scheffe.

(2) Product-moment correlations of individual subscale scores and total scores with reading vocabulary and reading comprehension achievement were computed.

The level of significance for the ANOVAs was set at $p < .05$. For the correlations the level of significance was set at $p < .01$. A probability of .01 was selected due to the large number of correlations calculated.

Descriptive Statistics

A descriptive summary of the mean and standard deviation scores on ability, achievement, and reading awareness for the three groups of students (gifted, average, and learning disabled) is presented. Students' cognitive ability was measured by the verbal and nonverbal subscales of the Canadian Cognitive Abilities Test (CCAT). The reading and math subscales of the Canadian Achievement Test (CAT) provided measures of student achievement. The results of the ability and achievement scores are reported in Table 1. Total test scores and subscale scores of the Reading Awareness Questionnaire are presented in Table 2.

The respective means for the gifted, average, and learning disabled students on the Canadian Cognitive Abilities Test verbal scores were: 126.7 (SD = 9.2), 100.4 (SD = 9.4), and 93.0 (SD = 10.4). Nonverbal mean scores on the Canadian Cognitive Abilities Test for the above groups were: 121.5 (SD = 10.1), 100.3 (SD = 11.6), and 96.3 (SD = 11.4) respectively. Gifted students demonstrated the highest level of achievement on the reading ($M = 8.75$, $SD = 1.6$) and math ($M = 6.00$, $SD = 1.2$) subtests of the Canadian Achievement Test. Mean scores for the average

Table 1

Student's Ability and Achievement Mean and
Standard Deviation Scores on the Canadian Cognitive
Abilities Test and the Canadian Achievement Test

	GIFTED	AVERAGE	LEARNING DISABLED
	n = 116	n = 127	n = 113
CCAT	M = 126.7	M = 100.4	M = 93.0
Verbal Subscale	SD = 9.2	SD = 9.4	SD = 10.4
CCAT	M = 121.5	M = 100.3	M = 96.3
Nonverbal Subscale	SD = 10.1	SD = 11.6	SD = 11.4
CAT	M = 8.75	M = 4.52	M = 2.81
Reading Total G.E.	SD = 1.60	SD = 0.85	SD = 0.64
CAT	M = 6.00	M = 4.37	M = 3.76
Math Total G.E.	SD = 1.20	SD = 1.10	SD = 0.97

students on the same subtests of the Canadian Abilities Test were 4.52 (SD = 0.85) and 4.37 (SD = 1.1) respectively. The learning disabled students demonstrated the lowest level of achievement on the reading ($M = 2.81$, $SD = 0.64$) and math ($M = 3.76$, $SD = 0.97$) subtests. The mean scores for the students in each of the three groups for both ability and achievement were in accordance with the criteria for student identification as outlined in the methodology chapter.

As can be seen from table 2, the gifted students demonstrated the highest level of reading strategy awareness on the **total score**, with a mean of 51.29 out of a total possible 66 points on the Index of Reading Awareness questionnaire. The average students' reading awareness mean score was 50.06. The level of reading awareness on the total score of the Index of Reading Awareness was lowest for the learning disabled group. The mean score of 48.67 out of a possible total 66 points would seem to indicate that the learning disabled students are aware of some of the reading strategies, although not to the same degree as the gifted students.

One-Way Analysis of Variance

Table 3 presents the five one-way ANOVA results comparing the means of the three groups; gifted, average, and learning disabled students on the Index of Reading Awareness.

Table 2

Reading Strategy Awareness Mean and Standard Deviation
Scores For Gifted, Average, and Learning Disabled Students

	Gifted	Average	Learning Disabled	Total
Reading Awareness Questionnaire	n = 116	n = 127	n = 113	N = 356
Evaluation	M = 16.94 SD = 2.18	M = 16.49 SD = 2.02	M = 16.10 SD = 2.27	M = 16.51 SD = 2.17
Planning	M = 11.66 SD = 1.63	M = 11.73 SD = 1.50	M = 11.25 SD = 2.13	M = 11.55 SD = 1.77
Regulation	M = 10.92 SD = 1.75	M = 10.40 SD = 1.83	M = 10.09 SD = 1.71	M = 10.47 SD = 1.79
Conditional Knowledge	M = 11.78 SD = 1.59	M = 11.44 SD = 1.68	M = 11.24 SD = 1.67	M = 11.49 SD = 1.65
Total Score	M = 51.29 SD = 4.85	M = 50.06 SD = 4.73	M = 48.67 SD = 5.14	M = 50.02 SD = 5.01

Table 3

Summary of One-Way ANOVAs for Gifted, Average, and Learning Disabled Students on the Index of Reading Awareness

Source	df	Mean Squares	F Ratio	Probability
<u>Evaluation Subscale</u>				
Groups	2	20.23	4.37	0.013*
Error	353	4.63		
<u>Planning Subscale</u>				
Groups	2	7.88	2.54	0.080
Error	353	3.10		
<u>Regulation Subscale</u>				
Groups	2	20.37	6.52	0.002**
Error	353	3.12		
<u>Conditional Knowledge Subscale</u>				
Groups	2	8.43	3.13	0.045*
Error	353	2.70		
<u>Total Score</u>				
Groups	2	196.08	8.15	0.000***
Error	353	24.05		

Significance Levels = * $p < .05$
 ** $p < .01$
 *** $p < .001$

Scheffe test results revealed significant group differences ($F(2, 353) = 8.15, p < .001$) in the mean reading strategy awareness **total scores** between the gifted and the learning disabled students (mean difference = 2.62). The gifted students obtained significantly higher mean total scores than the learning disabled students. No significant differences were found between the gifted and the average students or between the average and the learning disabled students (see Table 4).

The one-way ANOVA results on three of the four subscale scores (evaluation, regulation, and conditional knowledge) were consistent with the results on the total scores. Significant group differences were obtained on the **evaluation, regulation, and conditional knowledge** subscales (see Table 3). The Scheffe tests confirmed that the gifted group reported significantly greater awareness of reading strategies as compared to the learning disabled in evaluation (mean difference = 0.84), regulation (mean difference = 0.83), and conditional knowledge (mean difference = 0.54). (See Table 4.) No significant differences were obtained between the gifted and the average students or between the average and the learning disabled students on these three subscales. However, on the regulation subscale a trend was evident between the gifted and the average groups. The ANOVA and Scheffe test results distinguished between the two groups of students (gifted and

Table 4

Summary of Scheffe Post Hoc Fairwise Contrasts
on the Index of Reading Awareness for
Learning Disabled, Average, and Gifted Students

Group	Mean Difference	df	F	Probability
<u>Evaluation Subscale</u>				
Average - LD	0.39	2, 353	1.97	0.374
Gifted - LD	0.84	2, 353	8.77	0.013*
Gifted - Average	0.45	2, 353	2.67	0.265
<u>Planning Subscale</u>				
Average - LD	0.48	2, 353	4.53	0.105
Gifted - LD	0.41	2, 353	3.06	0.217
Gifted - Average	0.08	2, 353	0.12	0.944
<u>Regulation Subscale</u>				
Average - LD	0.31	2, 353	1.88	0.392
Gifted - LD	0.83	2, 353	12.75	0.002**
Gifted - Average	0.52	2, 353	5.27	0.073
<u>Conditional Knowledge Subscale</u>				
Average - LD	0.20	2, 353	0.90	0.636
Gifted - LD	0.54	2, 353	6.12	0.048*
Gifted - Average	0.33	2, 353	2.52	0.285
<u>Total IRA Score</u>				
Average - LD	1.39	2, 353	4.81	0.092
Gifted - LD	2.62	2, 353	16.35	0.000***
Gifted - Average	1.23	2, 353	3.82	0.150

Significance Levels =
 * $p < .05$
 ** $p < .01$
 *** $p < .001$

the learning disabled) on the evaluation, regulation, and conditional knowledge subscales. However, they did not differentiate between all three groups of learners.

No significant differences were found between the three groups on the **planning subscale** ($F(2, 353) = 2.54$,

$p = .080$) of the Index of Reading Strategy Awareness. The mean difference on the planning subscale between the gifted and the learning disabled students (0.41) was very similar to the mean difference between the average and the learning disabled students (0.48). Virtually no mean differences were obtained between the gifted and the average students on this subscale (mean difference = 0.08). These results would suggest that the gifted, average, and learning disabled students did not differ in their awareness of reading strategies on the planning subscale. However, a trend on this subscale was evident between the learning disabled students and the other two groups.

Correlational Analysis

Pearson product-moment correlations were computed to ascertain the relationship between the Index of Reading Awareness and the Canadian Achievement Test reading scores for the total 356 subjects. The relationship between the Index of Reading Strategy Awareness subscales and the Canadian Achievement Test reading subscales were noted. The resulting correlation matrix is presented in Table 5.

The results of the correlational analysis revealed significant correlations between the Index of Reading Awareness total score and the Canadian Achievement Test reading vocabulary ($r = .13$, $p = .009$) and reading comprehension ($r = .16$, $p = .002$) grade scores. A significant correlation was obtained between reading comprehension and reading awareness on three of the four subscales: evaluation ($r = .10$; $p = .030$), regulation ($r = .15$, $p = .002$), and conditional knowledge ($r = .18$, $p = .000$). The highest correlation was between reading comprehension and the conditional knowledge subscale. No significant correlation was found between the planning subscale and reading comprehension achievement.

A significant correlation was also obtained between the reading vocabulary achievement grade scores and the regulation subscale ($r = .15$, $p = .003$) and between reading vocabulary and the conditional knowledge subscale ($r = .13$, $p = .009$). No significant correlation between reading vocabulary and the planning subscale or between reading vocabulary and the evaluation subscale was found.

Caution must be taken in interpretation of these results. Although these correlations are statistically significant, they are very small. One could question the possible practical significance because of the very low correlations.

Intercorrelations of the Index of Reading Awareness subscales revealed significant correlations ($p < .01$ or $p < .001$) between all four of the subtests and between the four subscales and the total score. As anticipated, the intercorrelations were higher for the total and the subscales scores than between the individual subscales. With respect to the Canadian Achievement Test reading scores, a very high correlation ($r = .81$, $p = .000$) was obtained between the reading vocabulary and the reading comprehension scores.

CHAPTER VI

DISCUSSION

The results of the study have shown differences in metacognitive reading awareness between gifted, average, and learning disabled fourth grade students. Furthermore, some relationship exists between students' metacognitive reading awareness and their reading achievement. The results will be discussed in terms of each of the three research questions.

Individual Differences in Overall Reading Strategy Awareness

As anticipated, the gifted grade four students reported the highest overall level of reading strategy awareness, while the learning disabled students reported the lowest overall level of reading strategy awareness as measured by the Index of Reading Awareness. According to the descriptive summary of mean scores, gifted students reported higher overall reading strategy awareness than did the average or learning disabled students. Average students scored higher on overall reading awareness than did learning disabled students. However, the statistical analysis revealed significant differences in overall reading strategy awareness only between the gifted and the learning disabled students. No significant group differences were found

between the gifted and average students or between the average and learning disabled students.

These results support previous research (Brown & Campione, 1986; Canney & Winograd, 1979; Forrest-Pressley & Waller, 1984; Garner & Kraus, 1981-1982; Moore, 1983; Palincsar & Brown, 1987a; Paris & Myers, 1981) which found good readers to be more metacognitively aware of the many important aspects of reading than poor readers. Specifically, Raykovicz et al. (1985) stated that good readers reported the use of various strategies to aid their comprehension while poor readers did not report the use of strategies. Moore (1983) found skilled readers to demonstrate greater metacognitive knowledge of person, task, and strategy variables than unskilled readers. Jacobs and Paris (1987) reported good readers to exhibit higher reading strategy awareness than poor readers. Similarly, the results from this study found gifted students (good readers) to demonstrate significantly greater metacognitive reading strategy awareness than learning disabled students (poor readers).

Furthermore, these results are consistent with strategy use research which showed poor readers as failing to utilize strategic behavior which enhances reading comprehension (Bristow, 1985; Brown & Campione, 1986; Palincsar & Brown, 1987a; Wong & Jones, 1982). An awareness of reading strategies is a prerequisite to the actual use of such

strategies. A reader who is unaware of the important reading variables cannot be expected to employ appropriate strategies in the event of comprehension failure (Brown, 1980). In addition, a moderate to strong relationship between reading awareness and strategy use has been reported (Lipson, Irwin, & Poth, 1986). Thus, reading awareness is one variable that must be considered in the interpretation of strategy use research.

Although these results clearly differentiate between the gifted and the learning disabled students, they do not differentiate between all three groups (gifted, average, and learning disabled). Previous learning strategy research with gifted students has distinguished them from the average students. Gifted students have reported a greater awareness of a larger number of strategies. They demonstrate a more indepth understanding of metacognitive strategies, utilize more effective learning strategies and perform higher on strategy tasks than their average peers (Borkowski & Kurtz, 1987; Borkowski & Peck, 1986; Mitchell & Irwin, 1985; Scruggs et al., 1985).

Likewise, research with learning disabled students has distinguished them from the average group. Learning disabled students are reported to have fewer strategies in their repertoire of skills, to fail to monitor their comprehension, and to use strategies less frequently than

their average or gifted peers. (Bristow, 1985; Borkowski & Kurtz, 1987; Brown, Campione, & Day, 1986; Palinscar & Brown, 1986; Schewel & Waddell, 1986).

The discrepancy of results between this research study and previous research may be due to the nature of the sample, to the specific type of metacognitive knowledge investigated, or both. The majority of research comparing gifted and average students or learning disabled and average students has focussed on two distinct groups of students. These studies have, almost exclusively, contrasted average students enrolled in regular classes with learning disabled or gifted students enrolled in special classes or programs (Bos & Filip, 1984; Chan & Cole, 1986; Chan et al., 1987, Clark et al., 1984; Mitchell & Irwin, 1985; Wingenbach, 1982, 1984). Such samples involve a more severe classification of learning disabled or gifted students than the present study, in which the learning disabled and the gifted students are part of the regular class. Given this difference in classification, it is not surprising that the results of this research study do not distinguish metacognitive reading strategy awareness differences between the average and learning disabled or between the gifted and average students, as do the previous research studies. Learning disabled students enrolled in regular classrooms are often students experiencing less severe reading difficulties than those found in special classes.

Metacognitive knowledge is viewed as late-developing (Baker & Brown, 1984b; Garner, 1987; Gordon & Braun, 1985). When comparing research studies, the age of the students in the sample must be considered. Previous research studies have distinguished between the exceptional and the average learners.

The results of the present research did not reveal a significant difference in reading awareness between the gifted and the average students or between the average and the learning disabled students. Students in this study were enrolled in grade four, whereas many of the cited metacognitive knowledge studies investigated a slightly older group of students (Bos & Filip, 1984; Clark et al., 1984; Garner & Kraus, 1981-1982; Mitchell & Irwin, 1985; Wong & Jones, 1982; Wong & Wong, 1986). Older students have consistently demonstrated greater metacognitive awareness than younger students (Canney & Winograd, 1979; Forrest-Pressley & Waller, 1984; Myers & Paris, 1978; Paris & Jacobs, 1984). Fourth grade students are often not as developmentally aware of the abstractions involved in metacognitive reading strategies as older students.

The type of metacognitive knowledge investigated must be taken into account when comparing results. The wide diversity in metacognitive knowledge may be an influential variable in the discrepancy of results between this research study and other studies. To illustrate, Myers & Paris

(1978) studied metacognitive awareness of person, task, and strategy variables. Canney and Winograd (1979) examined metacognitive knowledge about the nature and goals of reading. Wong and Wong (1986) investigated metacognitive knowledge about passage organization and vocabulary difficulty on the ease of studying. Mitchell and Irwin (1985) compared gifted students' awareness of different reading strategies.

Of the metacognitive knowledge research, this study is most similar to that of Jacobs and Paris (1987) both in terms of the sample and the metacognitive knowledge investigated. Jacobs and Paris reported only differences in reading strategy awareness between good and poor readers, although their sample was divided into high, middle, and low post hoc groups. Similarly, Forrest-Pressley and Waller (1984) found metacognitive knowledge differences between good/older and poor/younger readers. No significant differences between average and good readers or average and poor readers were obtained.

These two investigations are in accordance with the present study, where significant differences were only obtained in two of three groups investigated. Thus, when a similar sample of learners and metacognitive knowledge are considered, the present research study indicates support of previous research rather than a discrepancy of results.

Another possible explanation for the lack of differentiation among the three groups on the reading strategy awareness measure is that reading is a complex process which involves many variables, processes, and skills. Metacognitive knowledge about reading strategies is only one of these many components (Paris & Oka, 1986). Reading strategy awareness alone may not be salient enough to distinguish among these three groups of learners, or the sensitivity of the instrument may not be appropriate. Although Jacobs and Paris (1987) described the Index of Reading Awareness to be an effective instrument in discriminating reader differences, their results report a distinction in reading awareness between two groups of students (good and poor readers) rather than three groups (high, middle, and low readers).

An interesting finding of this study was the relatively high overall reading awareness mean scores of all three groups. The gifted, average, and learning disabled students scored 51.29, 50.06, and 48.67 points respectively, out of a total 66 possible points on the Index of Reading Awareness. Learning disabled students have generally been assumed to have a "metacognitive deficiency" or a "strategy deficit" in reading (Borkowski & Kurtz, 1987; Bos & Filip, 1984; Wong, 1979; Wong & Wong, 1986). This lack of metacognitive knowledge has been thought to have contributed to their difficulty in applying metacognitive strategies to the

reading process (Canney & Winograd, 1979; Myers & Paris, 1978)..

Results of this research study dispute the above assumption. The learning disabled students' score indicates a great deal of metacognitive awareness of reading strategies as measured by this instrument. These results are supported by Wong and Wong's (1986) research, which indicated learning disabled students to possess metacognitive knowledge about the vocabulary of a passage. Learning disabled students may possess the metacognitive knowledge about reading strategies but may not see the value of using them and thus not employ them during the reading process (Schewel & Waddell, 1986). Metacognitive reading strategy knowledge does not ensure that student will use such strategies. Conditional knowledge (knowing when and why to use specific strategies) has been identified as a critical component in improving students' performance and in the spontaneous transfer of strategies (Paris & Byrnes, 1989; Schunk, 1989).

Individual Differences in Specific Reading Strategy Awareness

The second purpose of this study was to investigate the metacognitive reading strategy awareness differences between the three groups of students in evaluation, planning,

regulation, and conditional knowledge. These results are similar to those found on the total reading awareness score, where a distinction in performance existed between the two groups (gifted and learning disabled) but not among the three groups. Gifted students demonstrated higher reading awareness in the areas of evaluation (an individual's assessment of oneself and the related activity), regulation (the monitoring of one's own strategies given the nature of the task and one's progress), and conditional knowledge (understanding when and why to use a particular strategy) than did the learning disabled group.

Previous research examining metacognitive knowledge of skilled and unskilled readers obtained similar results. Defining reading strategy awareness in terms of evaluation, planning, regulation, and conditional knowledge, Jacobs and Paris (1987) reported good readers to demonstrate higher reading awareness than poor readers. However, they did not report their results specifically in terms of these four components. Moore (1983) found good readers to be more aware of person, task, and strategy variables than poor readers. Although the focus of the present investigation is reading strategy awareness, person, task, and strategy variables are encompassed in the evaluation, planning, regulation, and conditional knowledge categories. Similarly, Wingenbach (1982, 1984) found gifted students to demonstrate metacognitive awareness of reading strategies.

Gifted students were reported to: describe strategies providing a rationale for their use, assess their comprehension employing specific reading strategies, and monitor the effectiveness of the strategies used, modifying them as necessary. These descriptions of reading strategy awareness in gifted students are similar to the respective subscales here of conditional knowledge, evaluation, and regulation.

With regard to the regulation subscale, the significant difference obtained between the gifted and the learning disabled students is in accordance with previous research. Good readers have been described as possessing more metacognitive knowledge about the reading process and the monitoring of reading comprehension than poor readers (Garner & Kraus, 1981-1982). This awareness of comprehension monitoring can be described as regulation.

With respect to the actual monitoring process, numerous research studies have concluded that unskilled and younger readers are not as effective in monitoring their reading comprehension as skilled and older readers (Baker & Brown, 1984b; Brown & Campione, 1986; Grabe & Mann, 1984; Myers & Paris, 1978; Paris & Myers, 1981). As students increase their awareness of the metacognitive processes, they have the ability to exercise more control over these processes (Sanacore, 1984).

The trend evidenced between the gifted and the average students on the regulation subscale is similar to the findings of Wong and Wong (1986). Wong and Wong reported differences between the above average and the average/learning disabled students in metacognitive knowledge about passage organization and vocabulary. It is probable that the regulation subscale of the Index of Reading Awareness is measuring a similar type of metacognitive knowledge to that in the Wong and Wong investigation. Regulation is defined as monitoring one's strategies according to the nature of the task and one's progress. Examples of questions from this subscale are: "What things do you read faster than others? (Item #7); Why do you go back and read things over again? (Item #15); What do you do if you come to a word and you don't know what it means? (Item #18)" (Jacobs & Paris, 1987, p. 270). The metacognitive knowledge about passage organization and vocabulary difficulty is task related and appears to be encompassed under regulation.

An unanticipated finding of this research study was that the gifted, average, and learning disabled students did not differ significantly from each other on the planning subscale of the Index of Reading Awareness. These results suggest that the three groups did not differ in their awareness of selecting a particular strategy to achieve a specific goal. Yet, numerous researchers have authorized

planning as one essential component of the metacognitive reading process (Baker & Brown, 1984b; Jacob & Paris, 1987; Paris & Lindauer, 1982; Wang & Peverly, 1987). However, a trend was evident between the learning disabled and the gifted/average students. This trend is consistent with the results on the total score and the other three subscales which differentiated between the gifted and the learning disabled students.

One possible explanation for the lack of differentiation between the three groups on planning, may be that the reading awareness strategies assessed by the planning subscale are easier than are the evaluation, regulation, and conditional knowledge components. For example, the planning questions of the Index of Reading Awareness focus on the following strategies: reading for meaning (Item #11), selecting the purpose for reading (Item #14), reading for the main idea (Items #8 & #12), and the use of skimming (Item #16). These are reading objectives which are specified in the Program of Studies (Alberta Education, 1982) and may be more familiar to the students than the questions on the evaluation, regulation, and conditional knowledge categories.

Another plausible explanation for these results may be due to sensitivity of the measurement instrument. The planning subscale items of the Index of Reading may not adequately discriminate among the gifted, average, and

learning disabled students. Although Jacobs and Paris (1987) reported the Index of Reading Awareness to be an effective instrument in discriminating reader differences, only overall reading awareness scores were discussed. Results in terms of the four subscales of evaluation, planning, regulation, and conditional knowledge were not reported. Further research on the instrument is needed because it is a relatively new measure which has not been normed or extensively developed.

The Relationship Between Reading Strategy Awareness and Reading Comprehension

Thus far, the discussion has focussed on reading strategy awareness differences among the gifted, average, and learning disabled students. The relationship between students' reading strategy awareness and their reading performance is also of interest. According to the correlational analysis, a significant correlation was revealed between the reading strategy awareness total score and the reading comprehension ($r = .16$; $p < .01$) and vocabulary scores ($r = .13$; $p < .01$) of the Canadian Achievement Test. Furthermore, a significant correlation was obtained between reading comprehension and reading strategy awareness on three of the four subscales (evaluation, regulation, and conditional knowledge). Although the relationship between reading strategy awareness

and reading performance is statistically significant, it is a relatively low correlation. While one cannot expect an extremely high correlation, caution must be taken in interpreting these results as they do not indicate a strong relationship between reading awareness and reading comprehension.

These results indicate that some relationship exists between students' awareness of reading strategies and their reading comprehension performance. Previous research studies found a relationship between metacognitive knowledge and reading performance (Jacobs & Paris, 1987; Moore, 1983; Moore and Kirby, 1981; Paris & Jacobs, 1984; Wingenbach, 1982, 1984). Paris and his colleagues reported a higher reading awareness level to be associated with higher reading comprehension scores (Jacobs & Paris, 1987; Paris & Jacobs, 1984; Paris & Oka, 1986). Paris & Jacobs (1984) obtained modest pretest correlations between the reading awareness interview and the Gates MacGinitie comprehension test for third grade ($r = .28$; $p < .01$) and fifth grade ($r = .40$; $p < .001$) students. This relationship was stronger for fifth grade students than third grade students, indicating their awareness to be more closely related to their comprehension performance. In a later study, Paris and Oka (1986) examined the relationship between reading comprehension as measured by the Gates MacGinitie Reading Test and reading awareness as measured by the Index of

Reading Awareness. Results revealed significant pretest correlations of $r = .41$; $p < .01$; and $r = .33$; $p < .01$ and post-test correlations of $r = .37$; $p < .01$ and $r = .40$; $p < .01$ for third and fifth grade students respectively. These correlations are slightly higher than those obtained in the present study and may be attributed to the larger sample in the Paris investigation (grade 3, $n = 665$ and grade five, $n = 745$).

In the present study, the highest correlation ($r = .18$) was obtained between conditional knowledge and reading comprehension. This suggests that an individual's awareness of reading strategies as measured by the items on the conditional knowledge subscale may be most closely related to one's reading comprehension. Furthermore, this is the subtest which may be initially most related to generalization.

Skilled and gifted students have been reported to demonstrate superior performance in strategy awareness, strategy use, and generalization. They are adept at describing specific strategies and providing a rationale for their use (Wingenbach, 1982, 1984). Gifted students spontaneously utilize more effective and complex learning strategies more quickly and easily than their average peers. In addition, they demonstrate more effective generalization on "far transfer" tasks (Borkowski & Peck, 1986). This understanding of why and when to utilize specific strategies

has been identified as a critical component in successful transfer and maintenance of skills (Paris & Oka, 1986; Pressley et al., 1987). In contrast, when taught new skills, learning disabled students have more difficulty generalizing to new tasks, particularly the more the new task or situation varies from the original task (Borkowski & Kurtz, 1987). This ability to generalize distinguishes the gifted and the learning disabled students.

The results of the planning subscale require particular consideration. No significant correlation was obtained between the planning component and reading comprehension. These results indicate that planning as measured by the Index of Reading Awareness is not significantly related to reading comprehension as measured by the Canadian Achievement Test. Furthermore, the results of the one-way ANOVA revealed no significant differences between the three groups of learners on the planning subscale. This suggests that students in each of the three groups may possess similar metacognitive reading awareness of planning strategies. Given the results of both these analyses, the items on the planning subscale require further examination. Examples of questions on this subscale include: "If you could only read some sentences in the story because you were in a hurry, which ones would you read? (Item #8); When you tell other people about what you read, what do you tell them? (Item #11); If the teacher told you to read a story

to remember the general meaning, what would you do? (Item #12) (Jacobs & Paris, 1987, p. 269). If these items accurately reflected the planning component of metacognitive reading awareness, one would anticipate a significant relationship between the planning subscale and reading comprehension, a discrimination between the three groups of learners, or both. Furthermore, this lack of relationship between the planning subscale and comprehension would contribute to the relatively low correlation between overall reading awareness and reading comprehension.

The design of the present study was causal comparative in nature. Thus, caution should be taken in assuming any cause-effect relationships between groups of students and reading awareness strategies or between reading strategy awareness and reading comprehension. Furthermore, these results must not be viewed in isolation but in the context of the numerous variables involved in reading. In addition to reading awareness, reading self-perceptions, cloze, error detection, social self-perceptions, and motivational orientation have been found to affect reading comprehension performance.

The degree of influence of these factors varied with grade and reading level of the students. Reading awareness highly predicted reading ability level for low readers and error detection and motivation for average readers, while attitudes and self-perceptions predicted reading success for

high readers (Paris & Oka, 1986). The low correlations between reading awareness and reading comprehension obtained in the present study may suggest that although reading awareness is an important factor in reading comprehension, many other important variables are involved in the reading process.

CHAPTER VII

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The purpose, methodology, and major findings of the present investigation will be summarized in this chapter. A discussion of the limitations of this study and recommendations for future research will follow. Finally, implications of the research for practioners and researchers will be discussed.

Summary

A review of the literature indicates that skilled readers demonstrate greater metacognitive knowledge of the various reading components than unskilled readers (Canney & Winograd, 1979; Forrest-Pressley & Waller, 1984; Garner & Kraus, 1981-1982; Moore & Kirby, 1981; Myers & Paris, 1978). Proficient readers are strategic readers. They know when, how, and why to use various reading strategies. They are aware of the reading strategies required to achieve different purposes and the value of such strategies (Paris et al., 1983; Pressley et al., 1987). This awareness and reflection of the various reading strategies affects how the reading task is approached and the strategies implemented in the event of comprehension-failure (Forrest-Pressley & Waller, 1984).

Although strategic learners have been identified as utilizing the processes of planning, evaluation, regulation, and conditional knowledge, few studies have investigated these specific metacognitive components in reading (Paris & Lindauer, 1982). Furthermore, investigations examining the relationship between metacognitive knowledge and reading comprehension have been limited. The majority of the existing studies have investigated two groups of learners, the skilled and unskilled. Very few investigations have examined three groups of learners within the regular classroom. Therefore, the primary purpose of this research study was to investigate reading strategy awareness differences between gifted, average, and learning disabled fourth grade students, enrolled in regular classrooms. Evaluation, planning, regulation, and conditional knowledge were the specific reading strategy awareness components examined. A secondary purpose was to investigate the relationship between reading strategy awareness and reading comprehension performance.

From the initial screening, data for 356 subjects was obtained and analyzed. The sample consisted of 116 gifted, 127 average, and 113 learning disabled students enrolled in regular grade four classes. Following the descriptive summary, five one-way ANOVAs were conducted to determine differences between the three groups in overall reading strategy awareness, evaluation, planning, regulation, and

conditional knowledge. In addition, a correlational analysis was performed to examine the relationship between reading awareness and reading comprehension.

The results indicate that all three groups of students, including the learning disabled, possess some metacognitive knowledge about reading strategies. According to the descriptive statistics, the gifted students scored the highest on reported reading strategy awareness, while the learning disabled students scored the lowest. The one-way ANOVAs revealed significant group differences between two of the three groups. The gifted and learning disabled students differed on overall reading strategy awareness and on three of the four subscales: evaluation, regulation, and conditional knowledge. No significant differences between the groups were obtained on the planning subscale. On the basis of the correlational analysis, some relationship was established between reading comprehension performance and overall reading strategy awareness, evaluation, regulation, and conditional knowledge. Although this relationship was statistically significant, it was low. However, no significant correlation was obtained between reading comprehension and planning.

The differences in reading strategy awareness between the gifted and learning disabled students are consistent with previous research of skilled and unskilled readers. A lack of differentiation among the three groups may be

attributed to the nature of the sample, the type of metacognitive knowledge investigated, or both. The correlational analysis revealed some relationship between overall reading strategy awareness and reading comprehension. The lack of distinction between the groups on the planning subscale and the nonsignificant relationship between planning and reading comprehension suggest that the planning items of the Index of Reading Awareness require further investigation. An elaboration of these findings and a discussion in relation to existing research was presented in Chapter Six.

Limitations and Recommendations for Future Research

This study has certain limitations which require consideration in the interpretation of the results. One of the methodological limitations of this study is the "knowledge versus use" issue. The problem in using the Index of Reading Strategy Awareness as the sole assessment device, is that it is difficult to determine whether students actually use the strategies they report using. Some students may possess the awareness and ability to use the metacognitive reading strategies, yet not actually employ them during the reading process (Garner, 1987). Thus, the question remains as to whether the students who

differ in reading strategy awareness actually differ in the use of this metacognitive knowledge. Further research investigating reading strategy awareness, comprehension monitoring, and strategy use along the dimensions of evaluation, planning, regulation, and conditional knowledge would address this issue.

A second limitation is determining the accuracy of the reported metacognitive knowledge. This may vary among students based on their memory of the metacognitive processes and on their perceptions in completing the questionnaire. Variations in the accuracy of the students' responses may occur as a result of memory failure due to the automaticity of the reading strategies or as a consequence of the interval of time lapsed between the reading process and the reporting (Garner, 1987). Furthermore, self-report assessment methods have the potential limitation of being biased (Borg & Gall, 1983). Students may respond according to what they feel is a correct response or as what would be viewed as desirable. In order to overcome the problems associated with the students' various reading abilities, the questions on the Index of Reading Awareness questionnaire were read to the students. This may have presented somewhat more bias than if all the students were able to read the questionnaire independently. However, to avoid this limitation others would be incurred.

A third limitation is the type of metacognitive knowledge investigated. The Index of Reading Awareness was developed reflecting Paris's conceptualization of reading awareness. There may be other types of metacognitive knowledge and strategies that are equally important to successful reading not assessed by this questionnaire (Jacobs & Paris, 1987).

The fourth limitation is with the Index of Reading Awareness questionnaire. Given that the importance of metacognition has only recently been recognized, very few assessment measures have been developed in this area. Previous research has almost exclusively utilized the interview format to assess metacognitive knowledge. Thus, the use of the Index of Reading Awareness brings with it the limitations of a relatively new assessment instrument. Although the Index of Reading Awareness multiple-choice format overcomes some of the limitations of verbal report measures, it does not allow for student generated responses. Students must choose from the given alternatives and the issue of guessing is introduced (Paris, Wasik, & Van der Westhuizen, 1988). Furthermore, the Index of Reading Awareness has only three multiple-choice alternatives for each question. This in itself is limiting and may result in less discrimination between students than if there were more options available.

As has been noted previously in the discussion, some difficulty with the planning items of the questionnaire may be present. The planning subscale did not discriminate between the three groups or show a significant relationship to reading comprehension. The reported test-retest reliability ($r = .55$) over an eight month interval is adequate but not high. Furthermore, no specific normative data has been reported. These limitations may be attributed to the newness of the instrument and through further testing could be overcome.

A final limitation of this study is that only fourth grade students were investigated. Further research is required in the area of metacognitive reading strategy awareness with these three distinct groups of learners at various grade levels. Such research would clarify and expand our understanding of the role of metacognitive reading strategy knowledge in the reading process.

The present research study examined strategy awareness in reading. Future research investigating awareness and strategy use of evaluation, planning, regulation, and conditional knowledge across the various content areas would determine whether these are general strategies or whether they are specific to a particular content area. Moreover, research investigating the most effective instructional methods in this area for these three groups of learners would be invaluable.

Conclusions and Implications of the Research

Despite the limitations of this research study, the results indicate a positive relationship between reading strategy awareness and reading performance. Furthermore, overall and specific reading strategy awareness differences between gifted and learning disabled students were found. Although further research is necessary with strategy use and instructional methods, these findings have implications for teachers, school curriculum, teacher education, and assessment methods.

Traditionally poor readers or learning disabled students have been given additional instruction and practice with the skills components of reading (phonics, sight words, and decoding) while good readers or gifted students have been provided with an emphasis on reading comprehension and the higher order thinking processes (Jones, 1986). Thus, it is not surprising that research has characterized unskilled readers as being concerned with the decoding aspects rather than the comprehension aspects of reading (Canney & Winograd, 1979; Palincsar & Brown, 1987a; Paris & Myers, 1981). Moreover, the learning disabled readers have been viewed as having a 'deficit' in metacognitive knowledge (Borkowski & Kurtz, 1987; Torgesen, 1977). The results of this study suggest that learning disabled students possess some metacognitive awareness of reading strategies.

It is critical for teachers to recognize that the learning disabled or poor readers in their classes possess the ability to be aware of metacognitive reading strategies. Research has consistently shown that learning disabled students improve their reading performance when instructed in strategy use (Chan & Cole, 1986; Chan et al., 1987; Clark et al., 1984). Increasing reading strategy awareness may be a contributing factor in improved reading performance.

Metacognitive reading awareness must include conditional knowledge. Students need to be aware of the value of reading strategies and when to employ them in order to improve their reading performance and to spontaneously transfer such strategies (Paris & Byrnes, 1989).

An awareness of the relationship between metacognitive knowledge about reading strategies and reading performance would allow teachers to recognize the importance of incorporating this metacognitive knowledge into their reading instruction. Although further research is needed in instructional methods, teacher recognition of the importance of metacognitive knowledge in reading is the first step in employing changes in instruction. However, a general knowledge is not sufficient. An understanding of the differences in specific reading strategy awareness (evaluation, regulation, and conditional knowledge) among various learners in the regular classroom would assist

teachers in tailoring instruction to meet these individual needs.

Implications for teachers are that metacognitive reading awareness and strategy instruction are important for all students within the regular classroom. Although this would be most important for the learning disabled students, all students could benefit from such instruction. Learning disabled students would appear to require direct instruction in these areas as metacognitive knowledge is a prerequisite to the application of these strategies. Gifted students may not require this same basic instruction as they possess a greater reading strategy awareness. However, research in strategy use indicates that gifted students can also benefit from reading strategy instruction (Mitchell & Irwin, 1985; Scruggs et al., 1985).

As the view of reading must be expanded to include metacognition generally and reading strategy awareness specifically, this has implications for both assessment and instruction. Implications for assessment lie with the Index of Reading Awareness questionnaire and with reading assessments. With respect to the Index of Reading Awareness, the results of the planning subscale require particular consideration. The lack of difference between the three groups of students and the nonsignificant relationship between the planning subscale and reading comprehension would seem to indicate that planning may be a

misnomer for this scale. Perhaps further research could involve a factor analysis and an item analysis of the Index of Reading Awareness questionnaire. A revision of the questions and alternatives, on this basis, could include more choices for each item. Extensive testing of the Index of Reading Awareness, including validity, reliability, and normative data would potentially strengthen the usefulness of this instrument for both researchers and practitioners.

Present reading assessments which focus exclusively on vocabulary and comprehension are not adequate. Reading assessments (at both the formal and informal levels) need to include metacognitive aspects such as reading awareness. As there are presently very few such assessment measures, there is a need for further development of appropriate instruments to evaluate metacognitive reading strategy awareness (Jacobs & Paris, 1987).

If change within the educational system is to occur, then it must be directed to the teachers through the objectives of the curriculum and through teacher education. The results of this research indicate some relationship between metacognitive knowledge and reading performance. The current objectives of the language arts curriculum need to be modified to include metacognitive reading strategy awareness as one aspect of reading instruction. The components of reading strategy awareness must at least include conditional knowledge, evaluation, and regulation.

Teacher education with respect to metacognition needs to occur at both the inservice as well as preservice level.

Reading strategy awareness is one important component in reading comprehension and strategic learning. However, many other important variables are involved in the reading process. Paris & Byrnes (1989) present this more global perspective:

The development of strategic reading appears to depend on student's progressive understanding of the nature and usefulness of strategies that aid comprehension (Paris, Lipson, & Wixson, 1983).

But, strategic behavior involves more than simply knowledge or metacognition about strategies.

Children's theories of strategies must be joined with their theories of self-competence, effort, and academic tasks in order to be manifested in self-regulated learning. (p. 185)

The implications of this research are far reaching. Investigations of reading strategy use and the effects of reading strategy awareness instruction on reading comprehension and academic performance would provide further direction for teachers and researchers. Meanwhile, educators need to be aware that reading awareness is one variable in the reading process and that differences in reading strategy awareness exist among the learners in the regular classroom. Assessment, instruction, curriculum, and

teacher education are the areas potentially impacted by research in metacognition and reading. The anticipated benefits are students of the future who are proficient readers and self-directed learners.

REFERENCES

- Program of studies for elementary schools. (1982)
[Edmonton, Alberta]: Alberta Education,
Curriculum.
- Argulewicz, E. N. (1985). Review of scales for the
behavioral characteristics of superior students.
In J. V. Mitchell, Jr. (Ed.), The ninth mental
measurements yearbook (Vol. 2, pp. 1311-1312).
Lincoln, NE: University of Nebraska Press.
- Babbs, P. J., & Moe, A. J. (1983). Metacognition:
A key for independent learning from text.
Reading Teacher, 36, 422-426.
- Baker, L., & Brown, A. L. (1984a). Cognitive
monitoring in reading. In J. Flood (Ed.),
Understanding reading comprehension: Cognition,
language and the structure of prose (pp. 21-44).
Newark, DE: International Reading Association.
- Baker, L., & Brown, A. L. (1984b). Metacognitive
skills and reading. In P. D. Pearson (Ed.),
Handbook of reading research (pp. 353-394). New
York: Longman.
- Bondy, E. (1984). Encouraging children's use of
metacognitive processes: Thinking about thinking.
Childhood Education, 60, 234-238.
- Borg, W. R., & Gall, M. D. (1983). Educational
research: An introduction (4th ed.). New York:
Longman.
- Borkowski, J. G., & Kurtz, B. E. (1987).
Metacognition and executive control. In J. G.
Borkowski & J. D. Day (Eds.), Cognition in
special children: Comparative approaches to
retardation, learning disabilities, and
giftedness (pp. 123-152). Norwood, NJ: Ablex.
- Borkowski, J. G., & Peck, V. A. (1986). Causes and
consequences of metamemory in gifted children. In
R. Sternberg & J. Davidson (Eds.), Conceptions
of giftedness (pp. 182-200). Cambridge,
England: Cambridge University Press.

- Borkowski, J. G., Weyhing, R. S., & Carr, M. (1988). Effects of attributional retraining on strategy-based reading comprehension in learning-disabled students. Journal of Educational Psychology, 80, 46-53.
- Borkowski, J. G., Weyhing, R. S., & Turner, L. A. (1986). Attributional retraining and the teaching of strategies. Exceptional Children, 53, 130-137.
- Bos, C. S., & Filip, D. (1984). Comprehension monitoring in learning disabled and average students. Journal of Learning Disabilities, 17, 229-233.
- Bristow, P. S. (1985). Are poor readers passive readers? Some evidence, possible explanations, and potential solutions. The Reading Teacher, 39, 318-325.
- Brown, A. L. (1980). Metacognitive development in reading. In R. J. Spiro, B. Bruce, & W. F. Brewer (Eds.), Theoretical issues in reading comprehension (pp. 453-481). Hillsdale, NJ: Erlbaum.
- Brown, A. L. (1982). Learning how to learn from reading. In J. A. Langer & M. T. Smith-Burke (Eds.), Reader meets author, bridging the gap: A psycholinguistic and sociolinguistic perspective (pp. 26-54). Newark, DE: International Reading Association.
- Brown, A. L., Armbruster, B. B., & Baker, L. (1986). The role of metacognition in reading and studying. In J. Orasanu (Ed.), Reading comprehension: From research to practice (pp. 49-75). Hillsdale, NJ: Erlbaum.
- Brown, A. L., Bransford, J. D., Ferrara, R. A., & Campione, J. C. (1983). Learning, remembering, and understanding. In J. H. Flavell, & E. M. Markman (Eds.), Handbook of Child Psychology (Vol. 3, pp. 77-166). New York: Wiley.
- Brown, A. L., & Campione, J. C. (1986). Psychological theory and the study of learning disabilities. American Psychologist, 41, 1059-1068.

- Brown, A. L., Campione, J. C., & Day, J. D. (1981). Learning to learn: On training students to learn from text. Educational Researcher, 10(2), 14-21.
- CTC/McGraw-Hill Ryerson. (1983). Canadian Achievement Tests Technical Bulletin.. (Form A, Levels 12-19). Scarborough, Ontario: Canadian Test Center, McGraw-Hill Ryerson.
- Canney, G., & Winograd, P. (1979). Schemata for reading and reading comprehension performance (Tech. Report No. 120). Urbana-Champaign, IL: University of Illinois, Centre for the Study of Reading.
- Chan, L. K. S., & Cole, P. G. (1986). The effects of comprehension monitoring training on the reading competence of learning disabled and regular class students. Remedial and Special Education, 7(4), 33-40.
- Chan, L. K. S., Cole, P. G., & Barfett, S. (1987). Comprehension monitoring: Detection and identification of text inconsistencies by LD and normal students. Learning Disability Quarterly, 10, 114-124.
- Chipman, S. F. & Segal, J. W. (1985). Higher goals for education: An introduction. In S. F. Chipman, J. W. Segal, & R. Glaser (Eds.), Thinking and learning skills (Vol. 2, pp. 1-19). Hillsdale, NJ: Erlbaum.
- Clark, F. L., Deshler, D. D., Schumaker, J. B., Alley, G. R., & Warner, M. M. (1984). Visual imagery and self-questioning: Strategies to improve comprehension of written material. Journal of Learning Disabilities, 17, 145-149.
- Costa, A. L. (1984). Mediating the metacognitive. Educational Leadership, 42(3), 57-62.
- Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), The nature of intelligence (pp. 231-235). Hillsdale, NJ: Erlbaum.

- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. American Psychologist, 34, 906-911.
- Flavell, J. H. (1981). Cognitive monitoring. In W. P. Dickson (Ed.), Children's oral communication skills (pp. 35-60). New York: Academic Press.
- Flavell, J. H. (1985). Cognitive development (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Flavell, J. H. (1987). Speculations about the nature and development of metacognition. In F. E. Weinert & R. H. Kluwe (Eds.), Metacognition, motivation, and understanding (pp. 21-29). Hillsdale, NJ: Erlbaum.
- Flavell, J. H., & Wellman, H. M. (1977). Metamemory. In R. V. Kail, Jr., & J. W. Hagen (Eds.), Perspectives on the development of memory and cognition (pp. 3-33). Hillsdale, NJ: Erlbaum.
- Forrest-Pressley, D. L., & Waller, T. G. (1984). Cognition, metacognition, and reading. New York: Springer-Verlag.
- Garner, R. (1987). Metacognition and reading comprehension. Norwood, NJ: Ablex.
- Garner, R., & Kraus, C. (1981-1982). Good and poor comprehender differences in knowing and regulating reading behaviors. Educational Research Quarterly, 6(4), 5-12.
- Gavelek, J. R., & Raphael, T. E. (1985). Metacognition, instruction, and the role of questioning activities. In D. L. Forrest-Pressley, G. E. MacKinnon, & T. G. Waller (Eds.), Metacognition, cognition, and human performance (Vol. 2, pp. 103-136). Orlando, FL: Academic Press.
- Gordon, C. J., & Braun, C. (1985). Metacognitive processes: Reading and writing narrative discourse. In D. L. Forrest-Pressley, G. E. MacKinnon, & T. G. Waller (Eds.), Metacognition, cognition, and human performance (Vol. 2, pp. 1-75). Orlando, FL: Academic Press.

- Grabe, M., & Mann, S. (1984). A technique for the assessment and training of comprehension monitoring skills. Journal of Reading Behavior, 16, 131-144.
- Jacobs, J. E., & Paris, S. G. (1987). Children's metacognition about reading: Issues in definition, measurement, and instruction. Educational Psychologist, 22, 255-278.
- Jones, B. F. (1986). Quality and equality through cognitive instruction. Educational Leadership, 43(7), 5-11.
- Kreutzer, M. A., Leonard, C., & Flavell, J. H. (1975). An interview study of children's knowledge about memory. Monographs of the Society for Research in Child Development, 40(1) (Serial No. 159).
- Lawson, M. J. (1984). Being executive about metacognition. In J. R. Kirby (Ed.), Cognitive strategies and educational performance (pp. 89-109). Orlando, FL: Academic Press.
- Lipson, M. Y., Irwin, M. & Poth, L. (1986). The relationship between metacognitive self-reports and strategic behavior. In J. A. Niles & R. V. Lalik (Eds.), Solving problems in literacy: Learners, teachers, and researchers (pp. 214-221). Rochester, NY: National Reading Conference.
- Markman, E. M. (1981). Comprehension monitoring. In W. P. Dickson (Ed.), Children's oral communication skills (pp. 61-84). New York: Academic Press.
- Marzano, R. J., Brandt, R. S., Hughes, C. S., Jones, B. F., Presseisen, B. Z., Rankin, S. C., & Suhor, C. (1988). Dimensions of thinking: A framework for curriculum and instruction. Alexandria, VA: Association for Supervision and Curriculum Development.
- Mitchell, J. N. & Irwin, P. A. (1985). Reading strategies of gifted students. In J. A. Niles & R. V. Lalik (Eds.), Issues in literacy: A research perspective (pp. 227-232). Rochester, NY: National Reading Conference.

- Moore, P. (1983). Aspects of metacognitive knowledge about reading. Journal of Research in Reading, 6(2), 87-102.
- Moore, P. & Kirby, J. (1981). Metacognition and reading performance: A replication and extension of Myers and Paris in an Australian context. Educational Enquiry, 4, 18-29.
- Mulcahy, R. F. (1989, November). Cognitive Education Project Summary Report, Edmonton, Alberta: Alberta Education.
- Mulcahy, R. F., Peat, D., Mancini G., Andrews J., & Marfo K. (1989) Cognitive education: A longitudinal examination. In C. K. Leong & B. S. Randhawa (Eds.), Understanding literacy & cognition: Theory, research, & application (pp. 287-314). New York: Plenum Press.
- Myers, M., & Paris, S. G. (1978). Children's metacognitive knowledge about reading. Journal of Educational Psychology, 70, 680-690.
- Palincsar, A. M., & Brown, A. (1987a). Advances in improving the cognitive performance of handicapped students. In M. C. Wang, M. C. Reynolds, & H. L. Wahlberg (Eds.), The handbook of special education: Research and practice: Vol. 1. Learner characteristics and adaptive education (pp. 93-109). New York: Pergamon Press.
- Palincsar, A. S., & Brown, D. A. (1987b). Enhancing instructional time through attention to metacognition. Journal of Learning Disabilities, 20, 66-75.
- Paris, S. G. (1984). Teaching children to control their reading comprehension skills. (Final Report). Washington, DC: National Institute of Education. (ERIC Document Reproduction Service No. ED 254 840).
- Paris, S. G., & Byrnes, J. P. (1989). The constructivist approach to self-regulation and learning in the classroom. In B. J. Zimmerman & D. H. Schunk (Eds.), Self-regulated learning and academic achievement: Theory, research, and practice (pp. 169-200). New York: Springer-Verlag.

- Paris, S., Cross, D., DeBritto, A. M., Jacobs, J., Oka, E., & Saarnio, D. (1984, April). Improving children's metacognition and reading instruction with classroom instruction. Research colloquium presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Paris, S. G., & Jacobs, J. E. (1984). The benefits of informed instruction for children's reading awareness and comprehension skills. Child Development, 55, 2083-2098.
- Paris, S. G., & Lindauer, B. K. (1982). The development of cognitive skills during childhood. In B. W. Wolman (Ed.), Handbook of developmental psychology (pp. 333-349). Englewood Cliffs, NJ: Prentice-Hall.
- Paris, S. G., Lipson, M. Y., & Wixson, K. K. (1983). Becoming a strategic reader. Contemporary Educational Psychology, 8, 293-316.
- Paris, S. G., & Myers, M. (1981). Comprehension monitoring, memory, and study strategies of good and poor readers. Journal of Reading Behavior, 13, 5-22.
- Paris, S. G., & Oka, E. R. (1986). Children's reading strategies, metacognition, and motivation. Developmental Review, 6, 25-56.
- Paris, S. G., Oka, E. R., & De Britto, A. M. (1983). Beyond decoding: Synthesis of research on reading comprehension. Educational Leadership, 41(2), 78-83.
- Paris, S. G., Wixson, K. K., & Palincsar, A. S. (1986). Instructional approaches to reading comprehension. In E. Z. Rothkopf (Ed.), Review of research in education (pp. 91-128). Washington, DC: American Educational Research Association.
- Paris, S. G., Wasik, B. A., & Van der Westhuizen, G. (1988). Meta-metacognition: A review of research on metacognition and reading. In J. E. Readence & R. S. Baldwin (Eds.), Dialogues in literacy research (pp. 143-166). Chicago, IL: National Reading Conference.

Pressley, M., Goodchild, F., Fleet, J., Zajchowski, R., & Evans, E. D. (April, 1987). What is good strategy use and why is it hard to teach?: An optimistic appraisal of the challenges associated with strategy instruction. Paper presented at the American Educational Research Association Annual Meeting, San Francisco.

Raykovicz, M. L., Bromley, K., & Mahlois, M. (1985). The reading task as viewed by good and poor readers. Reading Improvement, 22, 87-91.

Sanacore, J. (1984). Metacognition and the improvement of reading: Some important links. Journal of Reading, 27, 706-712.

Schewel, R. H., & Waddell, J. G. (1986). Metacognitive skills: Practical strategies. Academic Therapy, 22, 19-25.

Schunk, D. H. (1989). Social cognitive theory and self-regulated learning. In B. J. Zimmerman & D. H. Schunk (Eds.), Self-regulated learning and academic achievement: Theory, research, and practice (pp. 83-110). New York: Springer-Verlag.

Scruggs, T. E., Mastropieri, M. A., Monson, J., & Jorgenson C. (1985). Maximizing what gifted students can learn: Recent findings of learning strategy research. Gifted Child Quarterly, 29, 181-185.

Short, E. J., & Ryan, E. B. (1984). Metacognitive differences between skilled and less skilled readers: Remediating deficits through story grammar and attribution training. Journal of Educational Psychology, 76, 225-235.

Slife, B. D. (1987). Can cognitive psychology account for metacognitive functions of mind? The Journal of Mind and Behavior, 8, 195-208.

Stewart, O., & Tei, E. (1983). Some implications of metacognition for reading instruction. Journal of Reading, 27 (1), 36-43.

Thorndike, R. L., & Hagen, E. (1984). Canadian Canadian Cognitive Abilities Test Technical Notes. Canada: Nelson Canada Ltd.

Torgesen, J. K. (1977). The role of nonspecific factors in the task performance of learning disabled children: A theoretical assessment. Journal of Learning Disabilities, 10, 27-34.

Wagoner, S. A. (1983). Comprehension monitoring: What it is and what we know about it. Reading Research Quarterly, 18, 328-346.

Wang, M. C., & Peverly, S. T. (1987). The Role of the learner: An individual difference variable in school learning and functions. In M. C. Wang, M. C. Reynolds & H. L. Wahlberg (Eds.), The handbook of special education: Research and practice: Vol. 1. Learner characteristics and adaptive education (pp. 59-92). New York: Pergamon Press.

Weinert, F. E. (1987). Introduction and overview: Metacognition and motivation as determinants of effective learning and understanding. In F. E. Weinert & R. H. Kluwe (Ed.), Metacognition, motivation, and understanding (pp. 1-16). Hillsdale, NJ: Erlbaum.

Whyte, L. A. (1985). Review of Canadian Achievement Tests, Form A. In J. V. Mitchell, Jr. (Ed.), The ninth mental measurements yearbook, (Vol. 1, pp. 257-258). Lincoln, NE: University of Nebraska Press.

Wingenbach, N. G. (1982). Comprehension strategies and metacognition. (Report No. CS-007-633). Kent State University. (ERIC Document Reproduction Service No. ED 244 237).

Wingenbach, N. G. (1984, April). The gifted reader: metacognition and comprehension strategies. Paper presented at The Annual Meeting of the National Council of Teachers of English Spring Conference, Columbus, OH.

Wong, B. (1979). The role of theory in learning disabilities research: Part 1. An analysis of problems. Journal of Learning Disabilities, 12, 585-595.

Wong, B. Y. L., & Jones, W. (1982). Increasing metacomprehension in learning disabled and normally achieving students through self-questioning training. Learning Disability Quarterly, 5, 228-240.

Wong, B. Y., & Wong, R. (1986). Study behavior as a function of metacognitive knowledge about critical task variables: An investigation of above average, average, and learning disabled readers. Learning Disabilities Research, 1(2), 101-111.

Appendix**Index of Reading Awareness**

Name _____ School _____ Teacher _____

Multiple Choice

Circle the best answer for you.

1. What is the hardest part about reading for you?
 - a. Sounding out the hard words.
 - b. When you don't understand the story.
 - c. Nothing is hard about reading for you.
2. What would help you become a better reader?
 - a. If more people would help you when you read.
 - b. Reading easier books with shorter words.
 - c. Checking to make sure you understand what you read.
3. If you are reading a story for fun, what would you do?
 - a. Look at the pictures to get the meaning.
 - b. Read the story as fast as you can.
 - c. Imagine the story like a movie in your mind.
4. What is special about the first sentence or two in a story?
 - a. They always begin with "once upon a time."
 - b. The first sentences are the most interesting.
 - c. They tell what the story will be about.
5. How are the last sentences of a story special?
 - a. They are the exciting, action sentences.
 - b. They tell you what happened.
 - c. They are harder to read.
6. If you were reading for science or social studies, what would you do to remember the information?
 - a. Ask yourself questions about the important ideas.
 - b. Skip the parts you don't understand.
 - c. Concentrate and try hard to remember it.
7. What things do you read faster than others?
 - a. Books that are easy to read.
 - b. When you've read the story before.
 - c. Books that have lots of pictures.

8. If you could only read some sentences in the story because you were in a hurry, which ones would you read?
 - a. Read the sentences in the middle of the story.
 - b. Read the sentences that tell you the most about the story.
 - c. Read the interesting exciting sentences.
9. How can you tell which sentences are the most important ones in the story?
 - a. They're the ones that tell the most about the characters and what happens.
 - b. They're the most interesting ones.
 - c. All of them are important.
10. If you are reading for a test, which would help you the most?
 - a. Read the story as many times as possible.
 - b. Talk about it with somebody to make sure you understand it.
 - c. Say the sentences over and over.
11. When you tell other people about what you read, what do you tell them?
 - a. What happened in the story.
 - b. The number of pages in the book.
 - c. Who the characters are.
12. If the teacher told you to read a story to remember the general meaning, what would you do?
 - a. Skim through the story to find the main parts.
 - b. Read all of the story and try to remember the meaning.
 - c. Read the story and remember all of the words.
13. If you are reading a library book to write a book report, which would help you the most?
 - a. Sound out words you don't know.
 - b. Write it down in your own words.
 - c. Skip the parts you don't understand.

14. Before you start to read, what kind of plans do you make to help you to read better?
 - a. You don't make any plans. You just start reading.
 - b. You choose a comfortable place.
 - c. You think about why you're reading.
15. Why do you go back and read things over again?
 - a. Because it's good practice.
 - b. Because you didn't understand it.
 - c. Because you forgot some words.
16. If you have to read very fast and could only read some words, which ones would you try to read?
 - a. Read the new vocabulary words because they are important.
 - b. Read the words that you could pronounce.
 - c. Read the words that tell the most about the story.
17. Which would help you read better?
 - a. Check to see if you understand the meaning.
 - b. Copy the whole story.
 - c. Write down the words you don't understand.
18. What do you do if you come to a word and you don't know what it means?
 - a. Use the words around it to figure it out.
 - b. Ask someone else.
 - c. Go on to the next word.
19. Which of these would help you understand a story?
 - a. Think about what the sentences mean and how they go together.
 - b. Look up all of the words in the dictionary.
 - c. Read the story aloud.
20. What do you do if you don't know what a whole sentence means?
 - a. Read it again.
 - b. Sound out all of the words.
 - c. Think of the other sentences in the paragraph.

21. What parts of the story do you skip as you read?
- a. The hard words and parts you don't understand.
 - b. The unimportant parts that don't mean anything for the story.
 - c. You never skip anything.
22. Which of these is the best way to remember a story?
- a. Say every word over and over.
 - b. Think about remembering it.
 - c. Write it down in your own words.